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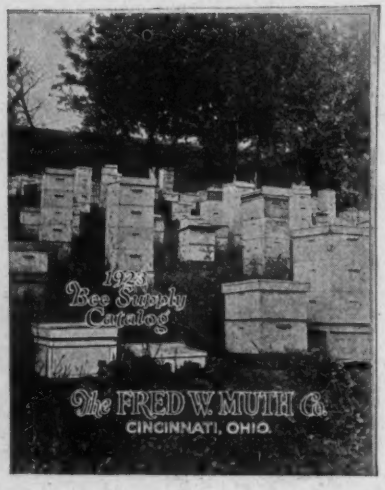
AMERICAN BEE JOURNAL

MARCH, 1923

BORTON'S APIARY AT SCOTLAND, SOUTH DAKOTA, WHICH HAS AVERAGED MORE THAN 200 POUNDS PER COLONY FOR THREE SUCCESSIVE YEARS

RECEIVE OUR 1923 CATALOG?

IT'S A "SURPRISE"



THINK of being able to buy Medium Brood Foundation in five pound boxes at 65c per pound, and Hoffman Frames at $5.90 per 100. Hives for almost half the price of a few years ago. Get our catalog---It's a big money saver for you.

Freight on Bee Supplies takes 3rd and 4th class rates. We ship everywhere and save you money regardless of where you live.

All this and QUALITY too when you deal with THE HOUSE OF MUTH

THE FRED W. MUTH CO.

"THE BUSY BEE MEN"

CINCINNATI, O.

FOR GREATER SUCCESS YOU SHOULD BUY

WOODMAN INNER OVERCOAT HIVES

Protected Bees Work Day and Night. It has been shown by careful observation that maintaining a temperature of 98 degrees permits comb building to go on **both day and night.** The bees will thus devote more daylight time to gathering honey.

Larger Honey Crops Are Assured. The bees are enabled to rear brood earlier in the spring, with no danger of chilled brood on account of cold snaps. One bee in March is worth one hundred in July. The early bees produce the early swarms, that get the large honey crops. Therein lies success or failure.

You will Practically Eliminate Winter Losses. With your colonies in normal condition (that is, with plenty of good stores, a young queen and young bees), you will be able to winter practically 100%.

The Inner Overcoat Hive will Last a Lifetime, as the outer hive walls are the same thickness as in the single-wall hive. In other words, **Woodman** Inner Overcoat Hives are **a lifetime investment—not an expense.**

Out-of-Door Wintered Bees Have Many Advantages over cellar-wintered bees. They do not spring-dwindle, and are stronger at the opening of honey flow.

Insures Close-up Protection. A person may have any amount of blankets fastened up to the wall of his room and still freeze to death if left in the center of the room without **close-up protection or insulation. The close-up protection in the Inner Overcoat Hive** is what does the trick.

Five one-story regular depth hives, $25; Jumbo depth, $27.50.

HOW TO USE

PROTECTION HIVES

When the bees are to be prepared for winter, remove the cleats which close up the insulating space. Then telescope one or more bottomless corrugated paper box insulators between inner and outer hive walls. Spread a piece of burlap or sacking material over the hive so that it will be carried down with the Inner Overcoats in telescoping them over the inner hive wall, having the effect of wrapping the brood nest in a blanket. These Inner Overcoats, with their air spaces, afford more protection than several inches of ordinary packing materials, and this is all secured in an insulating space of about one inch.

WOODMANS FAMOUS BEE-WARE

SPECIAL circular on Woodman's Protection Inner Overcoat, showing ten large illustrations, sent on request.

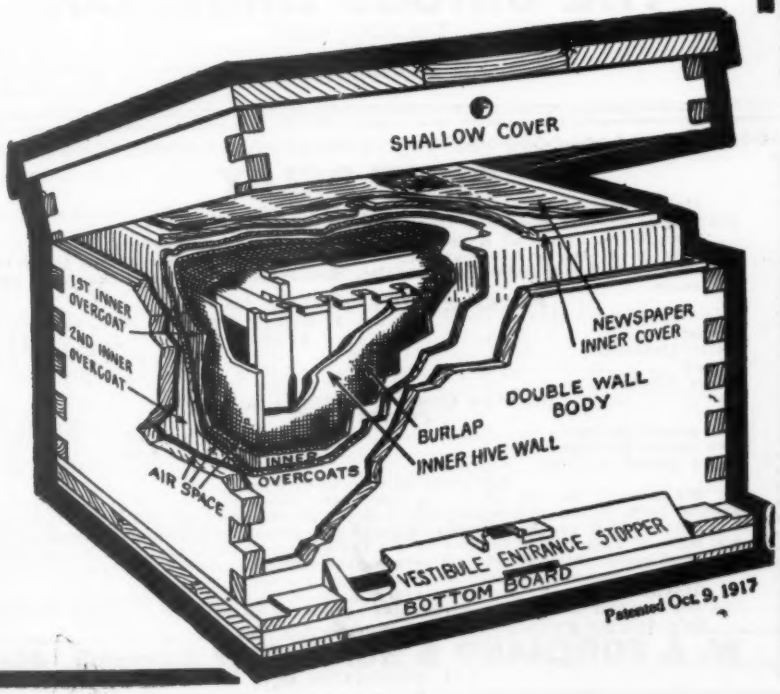
A. G. WOODMAN COMPANY

240 Scribner Ave. N. W.

SOLE MAKERS

GRAND RAPIDS, MICH.

U. S. A.



Here Is Your Chance

From factory to you, our excellent made material at attractive prices. Send in a list of your needs of BEE SUPPLIES for the coming season and get quotations on it.

Langstroth portico 8 and 10-frame hives and supers, also 8-frame 4x5 comb-honey supers at cost prices, while they last.

CHARLES MONDENG

146 Newton Ave. N. and 159 Cedar Lake Road

MINNEAPOLIS, MINN.

"GRIGGS SAVES YOU FREIGHT"

TOLEDO

Is the place ALL BEE MEN turn for GOOD BEE SUPPLIES. We mean, of course, those who wish "QUALITY" Goods, such as **LEWIS AND ROOT.**

Turn out. Their name means something on BEE SUPPLIES. To the successful HONEY man these goods, with GRIGGS SERVICE insures you of the Best at Lowest Cost to you.

OUR FREE CATALOG

Sent on request. Ask for it.

MAPLE SYRUP, HONEY and BEESWAX bought and sold by us or taken in exchange for supplies.

THE GRIGGS BROS. CO.

TOLEDO, OHIO

"GRIGGS SAVES YOU FREIGHT"

DON'T DELAY

Mr. Beekeeper: If you haven't placed your order for spring queens and bees, don't delay another moment.

Send W. J. Forehand & Sons your order and take no chances. Our queens and bees have been on the market for thirty years. They are known the world over for their honey-gathering qualities, disease resisting, gentleness and non-swarming.

PRICES ON QUEENS—Up to July 1st

	1 to 4	5 to 11	12 to 24	25 to 99	100 up
Untested	$1.25	$1.20	$1.15	$1.10	$1.05
Select Untested	1.50	1.45	1.40	1.35	1.30
Tested	2.50	2.45	2.40		
Select Tested	4.00	3.95			

Breeding Queens from $10.00 to $20.00

POUND BEES

	1	25 and up
One pound package	$2.50	$2.25
Two pound package	4.00	3.75
Three pound package	5.50	5.25

Add price of the queen wanted.

We take all the risk when you place your order with us. If there's any reduction made in our prices before your order is delivered, we will refund you the difference, and if you have over estimated your needs, or something happens that will make it unprofitable for you to use the queens or bees, notify us fifteen days before shipping date and we will return your deposits.

Only 10 per cent required for booking your order.

GUARANTEE—We guarantee every queen to be purely mated, reach her destination in good condition and will give perfect satisfaction.

Safe delivery guaranteed in U. S. and Canada only.

W. J. FOREHAND & SONS, Fort Deposit, Ala.

L. L. FOREHAND, Mgr.

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Olds' Bulb Garden

25 Splendid Flowering Bulbs

The Glory of the Summer Garden

For $1.00 Postpaid

We will send 12 new Hybrid Gladioli, 2 fine Dahlias, 3 Cinnamon Vines, and 8 Tuberoses (waxy white with orange blossom fragrance) for only $1.00 delivered.

Catalog of **Garden Seeds, Field Seeds, Bulbs,** and **Nursery Stock** sent free on request.

L. L. Olds Seed Company

Drawer 1B Madison, Wis.

White Leghorn CHICKS

Write Quick. Free feed—Liberal Discount on early orders: World-Famous 265-270, and 280-326 egg strain trapnested, pedigreed English American S.C.W. Leghorns, **Heavy Layers. Best Payers.** Strong healthy chicks. 100% live delivery guaranteed, p.p. *Big valuable catalog Free.*

KERLIN'S GRAND VIEW POULTRY FARM, Box 21 **Center Hall, Pa.**

Brookside Apiaries

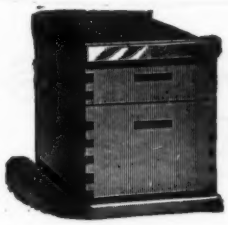
If it's more than ordinary queens you want, write us about our new Italian-Carniolan 1st cross strain. We will have full colonies at $10. Write for particulars.

O. E. TIMM, Prop.
Bennington, Nebraska.

MONEY AND SATISFACTION FOR YOU

Save one profit by buying direct from factory. Standard, Jumbo and Modified Dadant Hives; cedar or pine. Write for catalog.

A. E. BURDICK, CO.
Sunnyside, Wash.



MR. BEEKEEPER—

We have a large plant especially equipped to manufacture the supplies that you use. We guarantee all materials and workmanship. We ship anywhere. We allow early order discounts and make prompt shipments. *Write for free illustrated catalog today*

We pay highest cash and trade prices for beeswax

LEAHY MFG. CO., 90 Sixth Street, Higginsville, Missouri

J. W. ROUSE, Mexico, Missouri Texas Distributors, A. M. HUNT & SONS, Goldthwaite, Texas

Pound Packages Nuclei and Queens

Shipping begins March 15, and continues through the spring and summer. Capacity, 4,000 packages of nuclei. Safe delivery guaranteed within the United States and Canada. No disease. We breed from the best strains of three-band, leather colored and golden Italians that money can buy, and there is none better. Descriptive circular free. Ten per cent books order.

Two- pound package of Italian bees or two-frame nuclei, $4.00 each; 10 or more, $3.75 each.
Three-pound package of Italian bees or three-frame nuclei, $4.75 each; 10 or more $4.25 each.
Two-pound package of hybrid bees or two-frame nuclei, $3.75 each; 10 or more $3.50 each.
Three-pound package of hybrid bees or three-frame nuclei, $4.25 each; 10 or more $4.00 each.
One-frame nuclei, one pound extra Italian bees, $3.50 each; 10 or more $3.25 each.
One-frame nuclei, one extra pound of hybrid bees, $3.25 each; 10 or more $3.00.

A young untested Italian queen of the strain desired will be furnished free with any order listed above. The offer on hybrid bees is a material saving to the purchaser, as the queens are as purely mated Italian queens as can be had. I have only a limited amount of hybrids to offer.

BRAZOS VALLEY APIARIES, Gause, Texas

H. E. GRAHAM, Prop.

"Super-Service" and Satisfaction

Note the following copy of letter recently received:

Superior Honey Co.,
Ogden, Utah.

Gentlemen: The order you sent me arrived in fine shape and I wish to thank you for your fairness and promptness in this dealing. When I have another order it will go to you.

Yours truly, Lester Acord, Spring City, Utah.

Are you satisfied with your present source of supply? If not, why not try SUPERIOR **"SUPER-SERVICE"** on your next order?

News Items of Interest:

Cylindrical Wire Bound Bee Brush, 75c each, postpaid. (Will last longer that a dozen of the ordinary kind).

Wire and Cloth Bee Veil, $1.50 postpaid.

(Used exclusively in our own apiaries of over 5,000 colonies for several years. Has many distinctive points).

Metal Eyelets, 75c per thousand, postpaid.

(Something different. You put them in yourself and they stay "put.")
Tool for inserting metal eyelets, 25c.

Leather Palm Bee Gloves, $1.50 per pair, postpaid.

SUPERIOR HONEY COMPANY

Manufacturers of Beekeepers' Supplies.

General Office and Factory, Ogden, Utah. Branches at Idaho Falls, Idaho, and Riverside, Cal.

TENNESSEE-BRED QUEENS

Fifty-one Years' Experience in Queen-Rearing
Breed Three-Band Italians Only

	Nov. 1 to June 1			June 1 to July 1			July 1 to Nov. 1		
	1	6	12	1	6	12	1	6	12
Untested	$2 00	$ 8 50	$15 00	$1 50	$ 7 50	$13 50	$1 25	$ 6 50	$11 50
Select Untested	2 25	9 50	18 00	1 75	9 00	16 00	1 50	7 50	13 50
Tested	3 00	16 50	30 00	2 50	12 00	22 00	2 00	10 50	18 50
Select Tested	3 50	19 50	35 00	3 00	16 50	30 00	2 75	15 00	27 00

Select tested, for breeding, $7.50.

The very best queen, tested for breeding, $15.

Capacity of yard, 6,000. I sell no bees by the pound or nuclei, except with high-priced tested and breeding queens.

Queens for export will be carefully packed in long-distance cages, but safe delivery is not guaranteed.

JOHN M. DAVIS, Spring Hill, Tenn.

The Season's Greetings—

WHY—WHEN—WHERE

WHY—You should get your name on our mailing list; it means service to you throughout the year of 1923.

WHEN—Now is the time; a post card with your name and address will bring our Bee Supply Catalog to you.

WHERE—Service in every sense of the word is yours.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

QUEENS-OVER 10,000-QUEENS

Reared by our breeder. Who bought them? Beekeepers who wanted a good strain of honey gathering 3 banded Italian bees. Give our queens a trial and be convinced. Everything guaranteed free from disease and to please our customers. Delivery starts April 1. Orders booked now at our reduced price.

Untested.

1	queen	$ 1.00
12	queens	10.00
100	queens	75.00
1000	queens	700.00

Tested

1	queen	$ 1.50
12	queens	17.00

Good breeders, $5.00 each.
Write for prices on bees.

THE CITRONELLE APIARIES
CITRONELLE, ALA.

BEES Bred for Honey Gathering QUEENS

My bees are **Moore-Howe** strain, bred from select mothers chosen from my 1,000 colonies with special reference to honey-gathering, white capping, uniformity of color and gentleness.

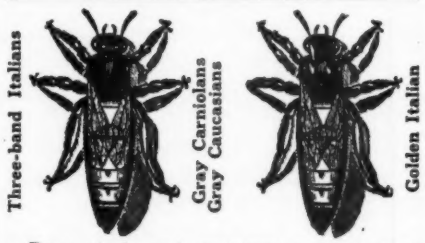
First premiums for the last five years at fairs in my section on queens and nuclei.

Prices for April and May:

3-frame nucleus with untested Italian queen ---------- $5.00
1 untested queen, $1, 25 or more, 90c each.
Tested queens, $1.50 each; 25 or more, $1.40 each.

I guarantee a square deal.

JOHN W. CASH, Bogart, Ga.



Pure stock and satisfaction guaranteed. Prices, Carniolans and Caucasions, untested, $1.25; tested, $2. Italians and Goldens, untested, $1, tested $1.50. Circular free.

GRANT ANDERSON,
Waco, Texas, Route No. 2.

OUR ANNOUNCEMENT

Read it on page 148 of this issue. Do it now.

W. A. HOLMBERG,
Denair, Calif.

A SUPERIOR QUALITY AT LESS COST

SUPPLIES

A SUPERIOR QUALITY AT LESS COST

(MADE BY THE DIAMOND MATCH CO.)

Compare our Prices. A trial Order will Convince You of the Superior Quality

One Story Complete Dovetailed Hives

With metal telescope cover, inner cover, reversible bottom Hoffman frames, nails, rabbets.

Standard size, crate of five, K. D. 8-frame	$13.30
Standard size, crate of five, K. D. 10-frame	13.90
Jumbo size, crate of five, K. D. 10-frame	14.95

HIVE BODIES AND EXTRACTING SUPERS

Including frames, nails, rabbets.

Standard size, crate of five, K. D. 8-frame	$5.45
Standard size, crate of five, K. D. 10-frame	6.15
Jumbo size, crate of five, K. D. 10-frame	7.20
Shallow, crate of five, K. D. 8-frame	4.10
Shallow, crate of five, K. D. 10-frame	4.45

COMB HONEY SUPERS

No. 1 Style.

For 4¼x4¼x1⅞ beeway sections, including section holders, separators, springs, tins and nails.

Crate of five, K. D. 8-frame	$3.95
Crate of five, K. D. 10-frame	4.30

HOFFMAN FRAMES

Standard size (corner cut top bar)	100,	$5.45	500,	$26.25
Shallow (corner cut top bar)	100,	5.25	500,	25.20
Jumbo (corner cut top bar)	100,	6.10	500,	29.40

DIAMOND BRAND FOUNDATION

SPECIAL PRICES

Medium, 5 lbs., 65c lb.; 50 lbs. 60c lb. Thin super, 5 lbs. 70c lb.; 50 lbs, 65c lb.

SPECIAL PRICES

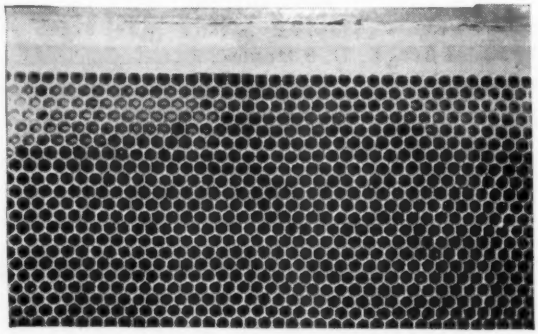
HOFFMAN & HAUCK, Inc., Woodhaven, N. Y.

Dadant's Wired Foundation is Efficient

BECAUSE

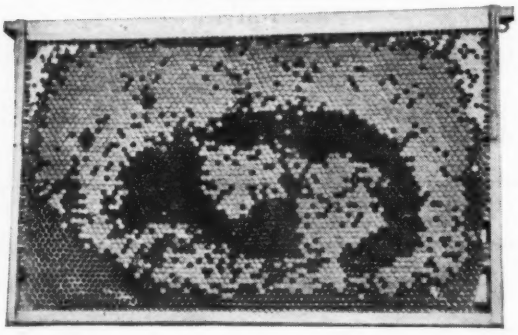
It Increases the Brood Area

Section from center of a brood comb.



Here cell sagging is usually the worst. Note how uniform These cells are over the entire area.

A comb of brood in a deep frame.



Sagging is usually bad in these big frames. Note the brood to the topbar.

Wired Foundation and slotted bottom-bar frames are sold by all distributors of Lewis "Beeware" and Dadant's Foundation. Send them your orders.

DO NOT FORGET we still make Dadant's Famous UNWIRED FOUNDATION

DADANT & SONS, HAMILTON, ILLINOIS

Beeswax—We need constantly large quantities of pure beeswax, and pay good prices for same. Ship to us at Hamilton Illinois, or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your station. As you wish.

1923 Package Bees, Nuclei and Queens For Sale

Prolific, bright, three-band Italians only.

Booking orders for April and May delivery. Second to none only in price. They are prolific, gentle, and great honey gatherers. All packages arriving in bad order immediately replaced, express prepaid. No disease in this territory. Health certificate with each shipment. Try my Special package of two pounds of bees on frame of emerging brood and honey, with quee n introduced and laying en route, at $4.75 each. One-pound package on frame of emerging brood and honey with introduced queen, $4.00. Bees ship best on frame of honey and brood.

Two-pound package without queen _____$3.00
Three-pound package without queen _____$4.00

Nuclei same price. Select young three-band qucen, with above, $1.00 extra.
Select untested three-band queen, $1.25, six $7;
twelve, $12. Start shipping March 20th.

Formerly **TUPELO HONEY COMPANY.**

J. L. MORGAN, Apalachicola, Florida

Reference: Apalachicola State Bank.

MONEY SAVED **BEE SUPPLIES** **TIME SAVED**

Roots goods at factory prices with WEBER'S Service

Send us a list of your wants and we will quote prices that will save you money

C. H. W. WEBER & CO., 2163-65-67 Central Ave., Cincinnati, O.

THREE FRAME NUCLEI COMBLESS PACKAGES AND PURE ITALIAN QUEENS

My aim is Quality, Quantity, Quick Service. See what some of my customers say, and be convinced that I am sending out the very best stock that money can buy.

Having had 27 years' experience as a large honey producer, as well as queen rearing and the package trade, places me in a position to know the beekeepers' needs to gather a good honey crop.

I am located in the best section in the South. We have thirty trains every day carrying express and mail, which enables me to get all shipments off with dispatch.

I guarantee every shipment as represented, and when they arrive in bad condition, have your agent note same, send me your claim and I will settle same at once and save you the trouble of trying to collect from the express company. This alone is an item worth considering.

My nuclei have enough bees to cover all three frames, therefore there is no need of an extra pound of bees, as they would do more harm than good, as bees must have plenty of ventilation while in transit.
A. B. Marchant, Jesup, Ga.

Dear Sir: In regard to the 50 nuclei I purchased from you last spring, they are world beaters; some of them made me over 200 pounds of comb honey. Would like to have 1,000 more. Frank Snyder, Anamosa, Iowa.

Dear Sir: Bees arrived in A No. 1 condition and I write to thank you. They are a nice lot.
C. S. Pickford, Halifax, N. S. Canada.

Dear Sir: The 20 three-frame nuclei you sent me averaged 150 pounds of comb honey, with 30 per cent increase. Slogan ought to be "Use more of Marchant's bees and harvest bigger crops." Merritt Oplinger, Walkerton, Ind.

Dear Sir: The nuclei arrived in almost perfect condition.—W. J. Abernathy, Beeton, Ont., Canada.

Dear Sir: Received last shipment today; arrived in good condition; the other shipment in fine shape; am well pleased with them. C. E. Jacox, Lander, Wyo.

Dear Sir: Received the 12 crates of bees with hardly a handful of dead ones in the lot. They are certainly a fine, fine lot. I will place my orders with you next year. Wilbur Swayze, Dunville, Ont., Canada.

Dear Sir: Received the bees April 22nd, in fine condition. They are certainly a fine lot of bees and the queens are dandy. You will receive the next of my orders. Roy H. Stitt, Illion, N. Y.

1923 prices of 3-frame nuclei with a select untested queen: 1 to 5, $5 each; 6 to 12, $4.90 each. Two-pound packages with queen: 1 to 5, $4.50 each; 6 to 12, $4.25 each. Write for prices on larger lots, also on 3-pound packages.

Prices of queens after May 15, single, $1.25, 6 for $5.50 12 for $10; 50 at 70c each; 100 at 60c each.

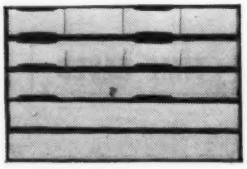
A. B. MARCHANT, JESUP, GEORGIA

REFERENCE: Brunswick Bank & Trust Co., Jesup, Ga.

49 YEARS FOR PROGRESS IN BEEKEEPING (*No. 3*)

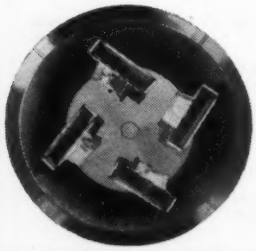
LEWIS IMPROVEMENTS
in BEEKEEPING EQUIPMENT

TAKING first advantage of the newest approved ways will help you to make money in beekeeping. Thousands of the leading honey producers---both individuals and organizations---have learned to watch with keen interest for announcements of new supplies bearing the mark of *Beeware* test and approval.



One-piece Section
The one-piece section—originated in the Lewis plant in 1888—now produced in ten million lots by our automatic machinery. Every piece closely inspected for quality and fine appearance, an important factor in getting the best prices and trade.

Lewis 4-Way Bee Escape
Empties full supers easily, quickly, with less danger of clogging up. See 1923 catalog, page 24, for full description and directions for the use of this notable improvement.



Lewis-Markle Power Extractor
New in design and principle. An essential to maximum profit in extracted honey production.
Illustrated booklet free.

In giving our best for 49 years to the development of the industry and co-operation with its leaders, it has been our privilege:

To invent and develop the one-piece section, now almost universally used for its fine appearance and convenience in comb-honey production.

To develop elaborate special automatic machines at an expense of many thousands of dollars for performing many operations more accurately and economically in the making of bee supplies. One example is the *special Lewis equipment for machining slotted bottom-bars, to be used with Dadant's Wired Comb Foundation.*

To develop and place on the market the now famous *4-way Bee Escape,* which contributes so much to convenience in removing full supers.

To co-operate with the inventor in perfecting, manufacturing and marketing the Lewis-Markle power honey extractor—already recognized as a very important single contribution to more profitable production of extracted honey.

Other improvements offered by this company that concern every progressive beekeeper are: The Modified Dadant hive, Lewis wax press, Lewis cappings melter and electric uncapping knife, Lewis wood and zinc queen excluders, Champion double-walled hive. For complete information on the most accurate hives and the latest improved bee supplies, consult our 52-page 1923 catalog. Postpaid anywhere in North America on request by anyone who produces honey for profit. When writing send name of local bee supply or hardware dealer.

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
REG. U.S. PAT. OFF.
LEWIS
WATERTOWN U.S.A.
MAKES THE FINEST.
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LEWIS BEEWARE

G. B. LEWIS COMPANY

Home Office and Works—Watertown, Wisconsin, U. S. A.

BRANCHES—ALBANY, N. Y. LYNCHBURG, VA. MEMPHIS, TENN. WICHITA, KAN.
OVER 200 DEALERS THROUGHOUT NORTH AMERICA

AMERICAN BEE JOURNAL

VOL. LXIII—NO. 3 HAMILTON, ILL., MARCH, 1923 MONTHLY, $1.50 A YEAR

BEEKEEPING IN NORTH DAKOTA

Notes on the Honey-Producing Opportunities in the Northern Plains Region

By Frank C. Pellett

THERE has been less written about beekeeping in the Dakotas than any other section of importance in America. The reason is simply that there has been little beekeeping there until very recently. The writer well remembers seeking information about 25 years ago from a well-informed beekeeper, who had recently left North Dakota. The man mentioned had taken a homestead in southeastern North Dakota and had lived there for a number of years. He expressed the opinion that bees could never be kept successfully in North Dakota—first for lack of pasture, and second because of the heavy winds which blow almost continuously during a large part of the year. Since that time, conditions have greatly changed. Sweet clover, the best possible bee pasture, is now abundant over large areas, but the wind still continues to blow and the bees gather their big crops of honey in spite of it.

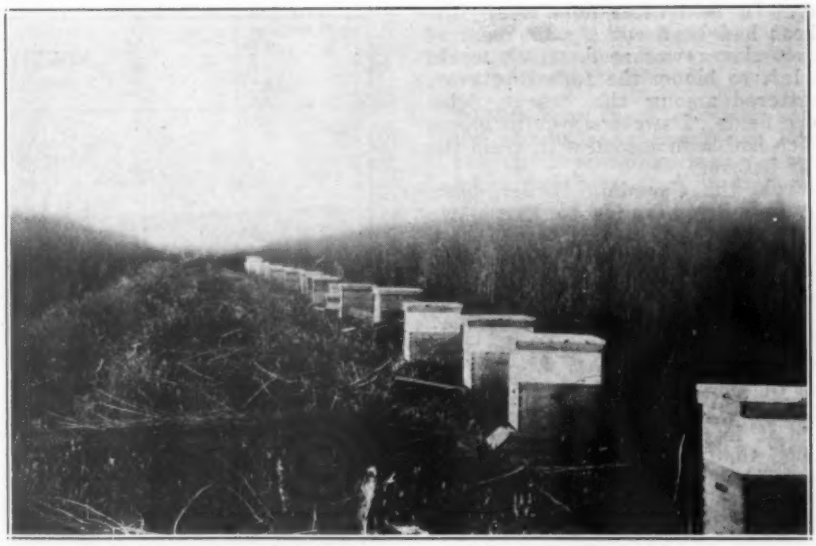
Since making a long journey through eastern North Dakota in company with Dr. and Mrs. Webster, of the North Dakota College of Agriculture, the writer has become very enthusiastic in regard to opportunities there. Frequently, however, he meets men who formerly lived there who refuse to be convinced that bees will do so well in North Dakota.

Sweet Clover at Its Best

Where we find a limestone soil, hot days and cool nights, with a moderate amount of moisture, there we find sweet clover yielding nectar freely. The difference between day and night temperatures may be the result of elevation, as in the mountain regions, or it may be the effect of latitude; the result is likely to be the same. The cool nights precipitate the sugars and the hot days stimulate the flow of nectar. Sweet clover seems to reach its maximum secretion in the Dakotas and nearby regions. In the writer's opinion, the greatest honey producing region in America will shortly be found from northwestern Iowa, northeastern Nebraska, northward through the Dakotas and prairie provinces of Canada. The reasons for this opinion are simply because sweet clover is regarded as the greatest of honey plants in America, and sweet clover is found at its best in this region. There are areas in the mountain states to the westward where it does equally well, but because of the nature of the country it can hardly be expected to be so generally distributed.

Crop Rotation

While wild plants are locally valuable, it is only those plants which are



Bees in North Dakota sweet clover field.

generally cultivated which make for a prosperous beekeeping region. White clover, because of its wide distribution as a pasture plant over the northeastern states, is the principal source of surplus honey in that vast region. Alsike in the meadows is likewise valuable over a large territory. In the west the cultivation of alfalfa as a field crop has made beekeeping a commercial possibility. In North Dakota the writer has seen miles of wheat fields where sweet clover covered the fields with green when the wheat was cut. In fact, it is the legume which is commonly used in that state to furnish nitrogen, following the grain. E. G. Pariezek, County Agent at Cavalier, N. Dak., stated that there were at least 10,000 acres of sweet clover in his county. After driving with him for half a day it was easy to believe it. The photos showing the threshers at work in the field of wheat and the cattle and horses in the sweet clover pasture, are typical of what we saw that day. In field after field where the wheat had been cut a solid mass of sweet clover was seen, which would be left to bloom the following year. Scattered among the wheat fields were fields of sweet clover in bloom which had been seeded with grain the year before.

Sweet clover pasture will support more live stock than any other pasture crop.

From the Canadian border, down the Red River Valley to Fargo, we drove, jogging back and forth to see people, or places which promised to be of interest. The amount of sweet clover varies greatly in different neighborhoods, but it is quite generally planted on the farms all the way. The value of the crop is so apparent that the acreage is constantly on the increase. Farmers who have once tried it in their rotation seem convinced that they cannot farm successfully without it. Sweet clover in this region takes the place filled by red clover and alsike in the corn belt. No system of agriculture can be permanent without live stock and some leguminous crop. Sweet clover is the only legume which serves the purpose in the crop rotation on the northern plains. Alfalfa is often grown by farmers who wish to establish a meadow to remain several years. It does not lend itself readily to a system which requires a crop to grow by itself for only one year and then be turned under to be followed by a crop of small grain.

Grand Forks County has a larger area of sweet clover, probably, than any other county, although several others are not far behind. D. B. Morris, the County Agent, checked up the acreage returned by the assessors. He found that there were 24,888 acres planted in 1921 and 15,155 in 1922, making a total of slightly more than 40,000 acres growing in the county at the time of our visit. This did not take account of the areas used continuously for pasture and allowed to re-seed year after year. In that county, Gilby is a sweet clover center and has probably the only elevator in existence built exclusively for handling sweet clover seed. At one time there was a stretch of four and one-half miles, along the road between Johnson and Gilby, with sweet clover planted in every field on both sides of the road. A. V. Eastman & Sons had 1,000 acres in sweet clover on their farms in 1920.

Not only is sweet clover the greatest soil builder known to our modern agriculture, but it will produce more pounds of beef or mutton than any pasture plant in common use, except alfalfa. Since there is less tendency to bloat on sweet clover than alfalfa pasture, it is much safer for that purpose. The common statement of farmers using it for pasture is that an acre of sweet clover would carry two head of cattle from May 15 until October 1. Where the crop is pastured it blooms through a long period and offers a continuous flow of nectar for the bees.

The Honey Crops

E. J. Harris, who has kept bees at Pembina for a long time, states that it was poor business until the coming of sweet clover. While there was some forage available it was not sufficient to make beekeeping profitable as a commercial enterprise. In early spring the bees get pollen and some nectar from the willows along the streams. Later dandelions furnish both nectar and pollen in abundance; but the dandelion is valuable principally to build up for the later flows. In some localities sow-thistle is abundant but farmers are making a hard fight against the pest, as they are also against the Canada thistle. It is only in neighborhoods where poor farming is the rule, where either is important to the bees. Snowberry is common on the prairies and is the source of good quality honey. However, the snowberry acreage has been largely reduced by cultivation. There is much gumweed in places, but the honey from gumweed is of indifferent quality and granulates quickly. It is only in waste places, in pastures

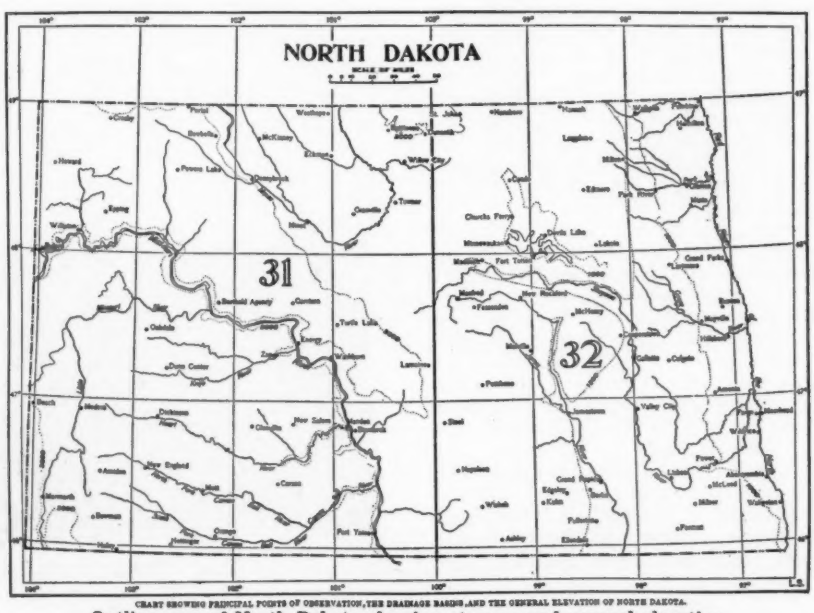


CHART SHOWING PRINCIPAL POINTS OF OBSERVATION, THE DRAINAGE BASINS, AND THE GENERAL ELEVATION OF NORTH DAKOTA.

Outline map of North Dakota showing streams and general elevation.

and along roadsides that it has room to grow. In fall, there is some honey from asters and goldenrods. The cottonwoods and poplars, elms and maples, furnish early pollen over much of the state. Caragana has been planted about the buildings by many farmers and furnishes some nectar, but is seldom sufficiently common to be important. On the whole, there is little surplus honey gathered except from sweet clover.

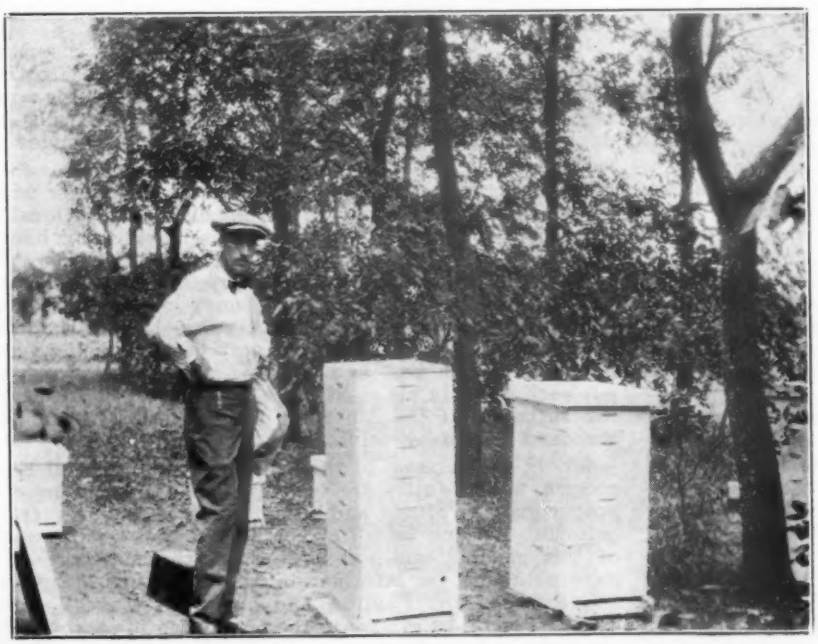
Spring comes late and winter comes early. There is accordingly a short and intensive season. The main flow does not come until about July 1st, leaving ample time to get all the colonies strong in time for the harvest, where properly managed. At Amenia, we found that Willis L. Crites had secured an average of about 100 pounds per colony, from nuclei received from June 6 to June 12. The bees were placed in the sweet clover fields on the farms of the Amenia and Sharon Land Co., as shown in the picture. Three hundred nuclei had been received, but with 2,000 acres of sweet clover there was ample pasture for many more.

In the east, sweet clover is not dependable as a source of nectar, due probably to the humidity of the atmosphere as well as the smaller variation between day and night temperatures.

While it is hardly safe to regard any plant as absolutely sure of producing nectar in quantity every year, sweet clover in North Dakota is probably as sure of doing so as anything in sight. It would seem to be safe to count on the pastures supporting one colony of bees for every two acres of sweet clover within two miles of the apiary, under these conditions.

Typical field of wheat with sweet clover, which will occupy the land the following season.

All the beekeepers visited who are up-to-date in their methods gave enthusiastic reports about the size of crops received from sweet clover. Under such conditions it was not unusual to find individual colonies producing from 300 to 500 pounds and an average production of 150 to 200 pounds. W. A. Richmond, of Grand Forks, had extracted 350 pounds from one colony and we estimated that there were 150 pounds on the hive gathered since. The season was not yet over. He had sold his crop for $40 per colony in 1921. His average was probably about the same in 1922, but falling prices may have reduced the returns.



Dr. Webster and a corner of the college apiary.

"APIS AMERICANA"

If all queen breeders were as pessimistic as Mr. H. W. Sanders (page 555, December American Bee Journal) on the question of the possibility of improving the characteristics of bees by selection, assuredly it would be a long time before any real progress would be made in breeding better bees.

But I do not think that Mr. Sandders is quite justified in all his statements. He says, for instance, that only the form, color, etc., of animals, have been changed by artificial selection, never the instincts or habits. This is far too sweeping an assertion. Instincts **have** been changed. The mere domestication of any animal involved the breeding out of the instinctive fear of man. The instinctive impulse to brood has been nearly eliminated from some races of hens. And habits have been changed and new ones evolved, vide, the retriever, the pointer, and the sheep-dog. Are not these changes in instincts and habits permanent and transmissible?

With bees, there is little doubt that the proclivity in the Dutch bee for excessive swarming, is a character which has been bred by artificial selection involved in the beekeeping methods of Holland. And there is no doubt that this character is fixed. If, therefore, it has been possible to increase the natural tendency to swarm, is any man justified in dismissing as absurd, the idea of attempting to reduce that tendency?

The difficulties of the job, owing to the special mating conditions, are doubtless great, but who shall say that they will prove insuperable to all future generations? We ought to have risen above the bigotry of the days of Dzierzon. In the 20th century it behooves us to cultivate the open mind. Delta S.

Scotland.

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THE EDITORS' VIEWPOINTS

INTERNATIONAL HARMONY

We are in receipt of a letter from a Brazilian beekeeper, Senor D. Amaro Van Emelen, who protests against the implied enmity between Allied and German scientists, suggested in the letter from Dr. Von Buttel-Reepen published in our November number, page 514. Mr. Van Emelen asserts that there is already a reconciliation apparent between the Catholics of France and those of Germany. Well, this should not be confined to any one of the numerous Christian creeds, or to any creed. If we follow the precepts of Christ (but do we?) we should treat everybody as a brother. Besides, do we not all live on the same sphere? If we should all try to do—as Edward Bok suggests—a little more than what is demanded of us, there would soon be peace on earth. Let us try!

BIBLIOGRAPHY

The New Jersey State Department of Agriculture has just issued Circular No. 35, entitled "A Manual of Bee Husbandry," written by our old friend Elmer G. Carr, with his usual ability. The manual contains 91 pages, fine illustrations, and is printed on excellent paper. It will be sent to New Jersey Beekeepers, on request, by the Department of Agriculture of New Jersey, at Trenton, N. J.

THE AMERICAN HONEY PRODUCERS' LEAGUE

Eighteen states are now represented in the League. Although our President is very much encouraged by the present prospect, that amount of representation is not sufficient. Every State in the Union should belong to the League if we are going to work efficiently in a co-operative manner.

A change was made in the Constitution which makes it possible for an association with only 25 members to join the League by paying $1 per member. The minimum amount used to be $100, and it kept the smaller associations out.

In the discussions it was brought out that a great deal may be done to place buyer and seller in contact through the League. Although nothing had been done previously, the fact was evidenced, by a verbal report of Miss Fisher, President Wilson's Secretary, that thousands of pounds of honey were sold through the medium of the Association by giving buyers the addresses of producers who had honey to sell.

Mr. Rauchfuss criticised the condition of the honey market in St. Louis, where many retailers are exceedingly divergent. A committee was appointed to make a canvass of the St. Louis honey market; but the time available was not sufficient to enable them to make a comprehensive report at this meeting. Much useful information will be gained if we can ascertain exact conditions and devise a remedy, by bringing the producers to a common interest, and through understanding of this injurious situation. St. Louis has always been one of the lowest honey markets of the United States.

By far the most important work of the meeting was a tentative arrangement to establish grades and names of extracted honey, on the color line. The localities represented being comparatively few, it is likely that the decisions reached will not be approved without restrictions on the part of the beekeepers at large, but a beginning has been made to secure an official standard of shades. Dr. Phillips had brought from Washington 300 samples in light glass bottles, graded in colors with the help of an instrument called the "spectrophotometer." With this instrument, the slightest differences in the color of honey are detected, and it is truly wonderful to see how different honies are graded, from the lightest "water-white" to the darkest buckwheat or honeydew honies.

Since it is impossible to describe colors in words, we must necessarily leave our readers in the dark as to the description of the 300 samples mentioned. It will be sufficient to say that the greatest difficulty and yet the most important requirement lies in carefully grading the light-colored honies. With the amber and dark grades, color is much less important. But "water-white," "extra white," "white," and "extra light amber" honies are valuable for blending, and it goes without saying that the whiter the honey, the better it is suited for a blend with dark or amber grades. Many people may shrug their shoulders and say that we do not eat honey with our eyes, and that, therefore, it is more important to grade it according to flavor. Yet we all know that much of the selling value of honey depends upon its color. So color grading is important.

At first sight, one thing is evident. Much of the honey which its producer calls "water white," when placed by the side of the whitest "water white," will have to go into one or other of the less white grades.

Five grades were accepted by the congress, as follows:

Water white, 40 samples.
White, 55 samples.
Light amber, 81 samples.
Amber, 84 samples.
Dark, 40 samples.

In addition to these, two more grades were accepted as subsidiary, to satisfy as close and fastidious honey judges ar Mr. Rauchfuss, of Colorado, who has perhaps had the most extensive experience of any man in grading hundreds of carloads of light colored honies. Under the seven grades the schedule reads as follows:

Water white, 24 samples.
Extra white, 22 samples.
White, 49 samples.
Extra light amber, 13 samples.
Light amber, 68 samples.
Amber, 84 samples.
Dark, 40 samples.

The figures accompanying each grade show the number of samples brought by Dr. Phillips from Washington, but in view of the fact that they have a still greater number of graded samples at Washington, there will evidently be a still greater number of various samples in each.

Perhaps the average honey producer will wonder what good this is going to do. If he sells all his honey locally, it will not serve him much. But when he offers his honey for sale on the distant markets it will help him to place its color grade with much more accuracy than by the present "guess work." We all think our honey just a little better and whiter than it really is; just as we believe that the soldiers of our country are the very best, we believe our honey to be the best and whitest. This regulation will put each of us in his right place, and we can make it, by the authority of the American League, the U. S. official standard for honey colors.

Mr. H. W. Samson, of the Bureau of Agricultural Economics, whose duties are to help the producers in the proper grading of any and all agricultural products, from cotton to cotton-seed oil and honey, performed the work of this grading and was present at the meeting. He gave us additional information to that furnished by our active friend Dr. Phillips, and explained that all farm products could be graded in the most scientific manner by the Bureau of Agricultural Economics, which has been established with the single purpose of helping the pro-

ducers of all kinds of agricultural crops, in grading and appraising their crops.

The large honey producer who failed to attend this national meeting will certainly have cause to regret it if he finds himself dissatisfied with the decisions of his brother honey producers. If we wish to keep up with the procession, we must attend our meetings.

The next place of meeting of the American Honey Producers' League has tentatively been suggested for Des Moines, Iowa, subject to the decision of the executive committee. Let us attend this in greater numbers than ever before. The honey producers of North America are counted by the hundreds of thousands, and we ought to have an attendance of at least 500, instead of a few dozens. Everybody has a voice in the decisions as well as in the discussions.

Among the statements made at the St. Louis meeting was one by Mr. Millen, the Official Apiarist of Guelph, Ontario, which interested our editor very much. Mr. Millen stated that 75 per cent of the extracted honey produced in Canada is sold in the granulated shape. He acknowledged that many people in Canada are still prejudiced against "honey gone to sugar," but that there was a great tendency to education on that score, because so many beekeepers insist that granulated honey is in a more natural condition than honey which has been heated to prevent its granulation. We believe this a step in the right direction.

It was evidenced at the St. Louis meeting that the State of Missouri, which has long been remiss upon the treatment of foulbrood, is coming to the front by applying for a large State appropriation for the control of that disease. This is good.

Since the lightest colored honies are the ones that contain the least matters differing from sugars, they are the best to winter bees, all other matters being equal.

Fireweed **Epilobium angustifolium)** honey is, from all accounts, to be classed among the lightest and best honies that America produces.

Honey and sugar both darken with age. Honey and sugar both darken with heat. A honey which has been melted is darker than the same honey which has not needed to be reduced from the granulated form.

Dr. Phillips exhibited two samples of alfalfa honey, at the National meeting, which were about two hundred samples apart, in the grading of honey for color. One of the samples was among the lightest colored, the other was among the decidedly amber. The one was a product from the northern states, the other from the Imperial Valley of California.

QUEEN BREEDERS

In the present number the reader will find an article urging the organization of queen breeders, as per article on page 28 of our January number. This matter may become practical. But the queen breeders will have to go very cautiously if they do not wish to tread upon the toes of some very straight breeders. Do not forget that it is possible to have errors as well in the apiaries of the recipients of queens as in those of the shippers.

But if the queen shippers organize into a mutual protective association we believe there will be much greater possibility of securing good queens. In some cases the breeding of queens is attempted by beginners; yet the queen-rearing business is **not, emphatically not,** that of a beginner. It takes more practical knowledge of bees for it than for producing honey, ten times over.

DIFFERENCE OF CONDITIONS CAUSING DIFFERENT RESULTS

The statements regarding water uses and storage, in the hive, which disagree completely with the recorded information of the past, may be due to different conditions.

I remember very clearly that, when I was about 20, my father had a very animated discussion with Canon Collin, of Metz, in L'Apiculteur, concerning an article in the American Bee Journal written by the late M. M. Baldridge and translated by Chas. Dadant for that magazine. It was concerning the saving of combs of pollen over winter to give them to breeding colonies in spring. Collin, who did not think anyone among beekeepers knew quite as much as he did, asserted that it was a waste of time to try to save pollen over from the previous year and that the bees, unable to use it, would have to cut out the entire comb which contained it, as the pollen would be mouldy and unfit for use. My father, just as strenuously, held that he had tried the suggestion of Baldridge and that the bees had put the pollen to use. He therefore recommended following the advice of Baldridge. They were both right and both wrong. In a dry winter and dry climate, pollen will keep very well till spring. But in a climate as moist as that of Metz, the pollen evidently became mouldy and worthless.

So when we contradict another man, who is speaking from experience, is it not a good plan to investigate whether the circumstances in which he keeps bees do not make a difference as to results? There would probably be much less controversy and much less ill-feeling if we remembered the possibility of difference in experience, caused by climate, moisture, time, and a thousand other things the effect of which we do not anticipate.

BEES AND RED CLOVER

There is much talk in uninformed circles of the possible damage to fruit by bees. They tell us the bees cut open the skin of fruit. If they could do this so easily, what would hinder them from cutting open the corolla of red clover, so as to remove its honey? Yet the only insects that do it, to our knowledge, are some kinds of wasps. Even as soft a thing as the clover bloom is evidently too firm for the mandibles of the bee.

BEES FROM GERMANY IN FRANCE

The colonies of bees in skeps, furnished by Germany to replace a part of the bees destroyed in France, have proved excessive swarmers, so we are informed by private as well as public correspondence. Small hives is the explanation.

IMPORTATIONS

Some time, about March 12th, a hearing will be held in Washington, D. C., on importation of foreign bees and queens. Parties desiring to be heard should correspond with Dr. Phillips at the Bureau of Entomology. This is to consider the method of enforcing the law of Congress passed last year forbidding the importation of bees from foreign countries. The exact date will be decided upon shortly.

APIS AMERICANA

Was there an American honeybee, originally? R. Whyte, in the Bee World, quotes Jes Dalton, in the Beekeeper's Item, as having read in a book entitled "Our New Possessions," the statement by Christopher Columbus, that he found honey in Cuba. From this the conclusion is drawn that there were bees in America before the white man came. Then why did the American Indian call the honeybee "the white man's fly"? And why did it not exist in the best honey regions of America, California? It is within modern man's memory that they were brought there. It looks as if Columbus was credited with a statement that he did not make.

READ YOUR MAGAZINES

Do you read everything carefully in the bee magazines so as to get all the information there is in them? The writer of this reads everything that goes into the American Bee Journal, first in the manuscript, then in the proof. Yet he often sees quotations made, of interesting things, in other magazines, taken frm the American Bee Journal, which he had forgotten.

Keep your magazines and have them bound. You will find them a useful library in years to come.

THE NEXT INTERNATIONAL CONGRESS

Mr. Vaillancourt writes us that in order to make the next International Congress a great success, he wishes to put it off until August or September, 1924. On the other hand, "L'Abeille & Sa Culture," of Huy, Belgium, suggests that the date be set for May, 1924. Many beekeepers of Europe appear to be greatly pleased with the idea of coming across the Atlantic for this Congress, but the present conditions in Europe would prevent a great number of them from coming, who would probably find it more convenient a year later.

THE RELATION OF THE HONEYBEE TO AGRIGULTURE

Structure of Flowers and Necessity of Cross Pollination

By Prof. J. J. Davis, Purdue University

"The honeydew from every flower
To Mistress Bee is marriage dower;
But, unlike woman, her sweet kiss
Ne'er injures him who gives her bliss."

(Translation of an old Persian verse, "The Bee and the Blossom," written about 1100 A. D.)

Co-operation not only within the industry but between mutually interested industries is essential for the greatest returns. Certainly there is a close relation between beekeeping and farming, particularly fruit farming, and to effect an intelligent co-operation it is important that the beekeeper understand this relation and the processes of pollination.

Recent studies show that about half of the 450,000 known kinds of insects are plant feeders. The amount and character of injury may be slight or great and it may affect non-economic plants or cultivated economic ones. At any rate, 50 per cent of all insects are dependent on plant tissue for food, the insect alone benefitting and the plant suffering all the injury. Of the remaining 50 per cent, or 225,000 kinds of insects, 16 per cent are predaceous, 17 per cent are scavengers, 12 per cent true parasites of other insects, 3 per cent are external parasites of mammals, and the remaining few per cent are purely productive, as the honeybee, or are of no apparent human importance. Many insects which are parasites, or productive, or are harmful to plants in some stage of their existence, visit and pollinate flowers and there is a mutual benefit, or if one is injured, the resulting benefit is so great, in comparison to the injury, that it does not impair the value of the relation.

There are three fundamental principles to be presented in order to establish the relation between bees and agriculture:

1. Cross-pollination, particularly of fruit flowers, is always desirable, and often necessary.
2. Wind does not properly nor efficiently distribute fruit pollen and that of certain other agricultural crops.
3. Honeybees cross-pollinate fruit and certain other crops better and more effectively than any human agent.

While some flowers may be self-fertile, others fertilized by wind or water, and a few by miscellaneous means, the great majority are dependent upon insects to assist in this work. The importance and value of insects in pollination was impressed upon the minds of investigators as far back as 1793 by the publication of a book by a German writer, Sprengel, on "The Secret of Nature in Form and Fertilization of Flowers Discovered." It was also early recognized that in no plant does self-fertilization occur for an unlimited number of generations, for as Darwin so aptly said, "Nature abhors perpetual self-fertilization."

That cross-pollination of fruits is always desirable and sometimes necessary, has been repeatedly shown by investigations in different places, both in America and abroad. In Oregon, Lewis and Vincent found 57 of the 87 varieties of apples studied were self-sterile, in other words, required cross pollination. The studies by Waugh in Vermont and Maryland gave similar results. Waite, in New York, and Fletcher in Michigan and West Virginia, found that Bartlett and Kieffer pears should not be planted without provision for cross-pollination. Waugh's experiments showed that the 55 varieties of native plums and 5 varieties of Japanese plums were self-sterile. Besides these and other experiments reported in literature we find many records of general observations in commercial orchards which confirm the experimental evidence. H. M. Dunlap, a well-known Illinois orchardist, once made the statement that orchards in Illinois planted to one variety seldom or never bore large crops, while nearby orchards with mixed varieties often produce enormous yields. These experiments and observations and others with such fruits as peaches, sweet cherries, grapes and small fruits show the importance and necessity of cross-pollination to obtain a good crop. Even for fruits which are self-fertile, cross-pollination is a decided advantage by improving the size and uniformity of the fruit. In fact, it is a well-recognized law of Nature that the crossing of different individuals, whether plant or animal, produces progeny with greater perfection in every respect than self-fertilization or inbreeding.

It is well that we recognize the process of fertilization. Sex in plants, although not so highly developed, is almost as common as in animals, and a study shows a similarity between plants and animals in a number of important relations.

The sexual organs of plants are quite as distinct as in animals. The male and female organs are the stigma and anthers, respectively, these organs being situated on stalks placed near the center of the flower. The male organs or anthers produce the pollen which, falling on the stigma, germinates and sends down a tube through the stalk bearing the stigma to the embryo seed or egg. The male nucleus thus uniting with the female nucleus completes the process of fertilization.

A self-fertile or self-pollinated fruit is one which is pollinated or fertilized with the pollen from the same variety. A self-sterile or cross-pollinated fruit is one requiring pollen from another variety for proper fertilization. In some cases, even if the flowers are self-sterile, the pollen-bearing organs are placed so that the pollen will not of its own accord fall on the stigma, the female organ. In other cases the male and female parts

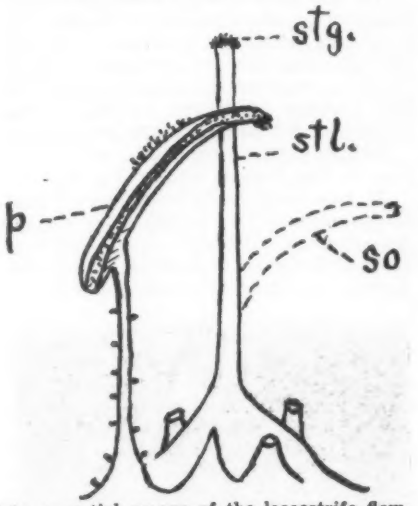
Blossoming time. Productiveness depends on insect pollination. Spraying with arsenicals should be avoided. (Photo by J. C. Allen).

do not mature at the same time so that when the stigma or female organ is receptive the male organs or anthers bearing the pollen are not yet mature. As a result of these and other differences pollen from different flowers or from another variety is essential to secure the necessary fertilization.

To prevent the detrimental influence of self-fertilization, plants are specially adapted to avoid this means of reproduction. These adaptations include: different periods of ripening of pollen and ovule, the placing or position of the male and female organs in different flowers (flowers or varieties containing only male organs and others only female) and sterility of pollen in the same flower or variety.

To be sure, wind, or we might say air currents, are of some value in carrying pollen from one plant to another. This is especially true of certain of the field crops and certain trees, especially conifers and nut-bearing trees. A typical example of fertilization by the wind is the corn plant. Here the pollen, developing in enormous quantities on the tassels, falls to the ears and lodges on the silk. Pollen alighting on any part of a green corn silk will germinate and the developing "root" of the pollen grain rapidly grows downward through the hollow corn silk until it reaches the female egg on the developing ear, resulting in fertilization of what develops into a grain of corn. From what we have said, however, it is evident that only a comparatively small per cent of flowers are fertilized by wind or water; in fact, of the 100,000 or more different kinds of plants, certainly not over 15 per cent are fertilized by wind or other means than insects. It is noteworthy that plants dependent on wind for cross-pollinization produce an abundant supply of dry, powdery pollen and are further notable for the absence of showy flowers and nectar glands, while flowers requiring cross-pollination by insects more often have sticky, doughy or heavy pollen and are more or less showy and attractive.

Briefly, the process of fertilization is the transferrence of pollen from the anthers of one flower to the stigma or female part of another, or possibly the same flower, and the process may be very simple or quite complex. It is usually a simple mechanical process, for insects, in seeking nectar, to rub against the anther and carry away with them on their legs or body greater or less quantities of pollen. The same insects in visiting another flower in turn transfer some of the foreign pollen to the stigma of that flower, thus permitting cross-pollination. Even though pollen from the same flower may not act as a fertilizing agent, cross-pollination is usually of greatest value since, as indicated before, foreign pollen is superior as a fertilizing agent to pollen from the same flower. The yucca moth and Blastophaga are notable examples of a complex inter-relation between insects and the pollination of flowers. The yuccas, for example, are dependent upon a single species of insect for pollination. The yucca moth, visiting several flowers, scrapes off the pollen and makes it into a small pellet which she carries to one of the flowers. After laying one or more eggs in the ovary of the flower she returns to the stigma and actually pushes the pollen which she has gathered into the stigma tube. This, and only this type of fertilization enables the ovules to develop into seeds, some of which are consumed by the larvæ developing from the eggs laid in the ovary by the moth. Thus the seeds are fertilized and at the same time, seeds are developed, some of which enable the yucca moth larva to develop. Fertilization of the fig by a small wasp, known as Blastophaga, is equally interesting and important. The fig industry of California is dependent upon this small insect. The superior quality of the Smyrna fig is due to the presence of ripe seeds, in other words, to fertilization. To secure fertilization it is necessary that pollen from wild figs be transferred to the flowers of the Smyrna fig. As a rule this cross-pollination is dependent upon the tiny Blastophaga, which develops in the flowers of the wild fig. The female insect goes from the wild flower to those of the Smyrna fig to deposit eggs and incidentally carries pollen from one to the other. After many attempts, the Blastophaga, which is a native of Algeria, was introduced and established in California, and as a result the fig industry has since developed rapidly.



The essential organs of the loosestrife flower, which requires cross-pollination. In seeking nectar the bees carry the pollen from the anther (p) to the receptive stigma (stg:) The dotted line (so) shows the position before it is in a receptive condition, at which time pollen could not likely be carried to the stigma by the bee. (After Needham).

It is well that fruit growers, farmers, and beekeepers alike, recognize the crops requiring cross-pollination, and the sources of the process. Probably fruit-growers as well as other farmers do not sufficiently recognize the importance of bees in the successful production of crops, nor is it likely that beekeepers fully realize the value of their stock in this regard or the value of certain crops to beekeeping. There is, undoubtedly, a mutual benefit which, if recognized, could be harmonized to the advantage of all concerned. Such important horticultural crops as the apple, pear, peach, plum, cherry, raspberry, clover, alfalfa, etc., and many others, are dependent on insects to cross-fertilize the flowers; in some crops such as cucumber, melon, pumpkin, etc., the male and female parts are in different blossoms, while in some crops, such as certain varieties of strawberries, individual plants or varieties bear the male flowers and other plants or varieties bear only the female flowers. In all such cases the necessity of transferring pollen from one flower to another is evident and this transfer is accomplished by insects.

In the majority of cases many insects may be responsible to a greater or less extent in this process of cross-pollination, but usually some one or a few kinds of insects are responsible in certain species. Thus, in the case of some flowers, as petunia, tobacco, and honeysuckle, the long-tongued sphinx or humming-bird moths are important. Certain other flowers are more attractive to the nocturnal or night-flying moths, many of which are adults of our common cutworms. Some flowers are pollinated exclusively by butterflies, a few such as goldenrod and pond lilies, are usually fertilized by beetles. Umbelliferous plants are pollenized chiefly by flies of various kinds, while the principal horticultural crops, such as fruit trees, vegetable crops, etc., and farm crops such as clover, alfalfa and soybean, are pollenized by bees and wasps.

Insects of all orders assist to a greater or less extent in cross-pollination, but by far the majority belong to four orders, namely: bees and wasps, butterflies and moths, beetles and flies, and they are important in the order named. The bees and wasps, and especially the honeybees, far surpass all other insects in importance as pollinators, and this may be largely due to the fact that many are wholly dependent upon the nectar secretions as food for themselves and their young.

The honeybee, which is probably responsible for the fertilization of 90 per cent of the fruit flowers, shows many remarkable adaptations in habits and structure for the purposes of pollination. They are present and active from very early spring until late fall, they reproduce rapidly and occur in great numbers. The structural adaptations are especially noteworthy. In the case of many insects with biting mouth parts, such as beetles, which feed upon pollen, we usually find the mouth parts or parts near the mouth densely clothed with hairs; certain of the moths are provided with long tongues to reach the nectar in long corolled flowers, such as the petunia; "pollen-gathering flies and bees collect the pollen in the hairs of the body or the legs, and these hairs, which are especially

dense and often twisted or branched to hold the pollen, do not occur on other pollen-gathering species of insects." The highest types of general adaptations are found in the honeybees. The thorax, abdomen and portions of the legs are clothed with flexible branching hairs which entangle and hold the pollen grains. You who are familiar with the external anatomy of the honeybee know of the pollen combs on the inner surface of the hind legs, by means of which the pollen is combed out of the gathering hairs. From these combs the pollen is transferred to the pollen baskets on the outer surface of the hind leg. When the bee reaches the cell the mass of accumulated pollen is pried off by means of a special spur situated on the middle pair of legs. While there are special adaptations in certain insects, the type and modification of the mouth parts and of the hairs are the important ones in connection with pollination. These modifications are all comparatively simple, however, in comparison to the manifold and wonderful adaptations of the flower for cross-pollination.

The question is often asked, what attracts insects, especially the honeybees, to flowers? And have flowers become modified as a result of the need of attracting insects? Undoubtedly the ultimate aim of insect visits to flowers is to secure nectar, and it is a common opinion that the nectar or odor attracts the insects. While the odor may be attractive in a few instances, the principal attraction appears to be the color and conspicuousness of the flower. Experiments have been made by removing the conspicuous floral parts of a flower, this being the only varying factor, and as a result these flowers did not attract insects. For example, Lewis, in Oregon, removed the floral parts, excepting the pistils, from the 1,500 blossoms of a 7-year-old apple tree, within 20 feet of other trees in heavy bloom. The tree from which the floral parts were removed set five fruits while the neighboring trees bore an abundant crop. Furthermore, during the time when the pistils were receptive, only 8 honeybees visited the emasculated trees, while on the adjacent trees bees were frequent visitors. Again, artificial flowers of various kinds without odor have been exposed, and they seemed to attract the insects as readily as the natural flower. It is rather definitely proven, therefore, that the principal attractive agent is the color and conspicuousness of the flower, and there appears to be evidence in favor of the theory that flowers have been developed in order to attract insect visitors.

Observations by Frison, in Illinois, show that bumblebees may visit more than 2,000 florets of red clover in the course of a half hour, and that a single colony of 200 bumblebees may be sufficient under optimum conditions to pollinate the flowers of an acre clover field. While we have no data on the common honeybee, there is every reason to believe that it is at least as active in its visits to flowers as is the bumblebee. In any case the number of visits or the number of flowers visited will depend largely on the nectar secretion available. It has been noted that the honeybee visits in succession flowers of the same kind. For example, bees feeding on flowers of apple blossoms will remain more or less continuously feeding on the flowers of apple as long as they find it profitable, thus assuring more complete pollination.

It has been shown that cross-pollination is essential to profitable agriculture; that many crops, fruits especially, require the assistance of insects in cross-pollination; and that of the insects attracted to fruit tree blossoms, 90 per cent are honeybees.

What, then, is the value of honeybees to the farmer and orchardist?

It has been truthfully stated that the honeybee is more valuable to American agriculture in its work of cross-pollination than as a honey producer, but its actual monetary value

Proper cross pollination is largely dependent on honeybees. Avoid spraying while the flowers are open. (Photo by W. A. Price.)

in this connection would be impossible to estimate.

Many instances of their worth in connection with fruit production could be cited.

An illustrative case was told by C. L. Burkholder, of the Horticultural Department, Purdue Agricultural Experiment Station. In this case, which was observed 6 or 7 years ago in an 80-acre cherry orchard at Belleview, Ohio, an apiary of perhaps 200 colonies was located near one end of the orchard. The year the observations were made the trees near the apiary bore a heavy crop, the set of fruit gradually decreasing the farther away from the apiary. The owner of the orchard was so thoroughly convinced of the monetary value of bees to cherry production that thereafter he paid a small sum to the owner of the apiary to distribute the colonies throughout the orchard.

Another striking example was observed at Tell City, Ind., in a backward season about 1917 or 1918. Several colonies of bees were located at one end of the apple orchard. After the fruit set, and later, there was a definite fruit area in the vicinity of the colonies, although elsewhere in the orchard little or no fruit set.

Still another interesting case, among the many that have been observed, might be mentioned. In a certain locality in an eastern state, the severe winters of 1911 and 1912, together with foulbrood, greatly reduced the numbers of bees. A colony of bees was moved into the center of a small block of peach trees in the spring of 1912. As a result, these trees set all the crop they could carry, although other orchards in the vicinity, where bees were not present, failed to set a crop.

Experiments and general observations, such as have just been given, have led to such conclusions as given by Lewis and Vincent, of Oregon, who say, "As the insurance of a crop depends upon insects as distributors of the pollen, it is necessary that apiaries be established in the different fruit sections."

The recognized value of bees to the fruit grower, and the close relation which exists between beekeeping and orcharding may be further illustrated by the fact that students at Purdue University, specializing in horticulture, must take a course in beekeeping as a requirement for graduation.

It is more or less generally recognized that bees in the orchard are of value every year and are essential in years when weather is rainy or cloudy. Probably a real need for bee colonies in the orchard occurs on an average once in every five years. The number needed per acre of orchard has been variously estimated from one to five colonies, but probably two per acre are enough for all practical purposes. The orchardist should recognize the value of the honeybee, should study his own conditions and experience, and with these facts determine for himself whether or not the hazard is sufficient to warrant keeping bees in the orchard.

The work of Price and others has shown that bees are susceptible to arsenical poisoning when trees are sprayed while in bloom. In fact, the danger is so thoroughly recognized that the laws of some states prohibit spraying fruit trees in bloom with arsenicals. Certainly it is not advisable, nor necessary, to spray with a poison at such times, for in addition to the injury to bees, the grower risks injury to the flowers. In certain years and with certain varieties, it becomes necessary to apply a spray for scab during the blossoming period, but since the poison is not required, the scab spray can be applied minus the arsenical, with the desired results. As was so aptly said, spraying with a poison when the trees are in blossom is like killing the goose that lays the golden egg.

QUEEN-CAGE CANDY

By Allen Latham

THE request has come to me that I write up for the columns of the American Bee Journal what I know about queen-cage candy. I shall accede to that request with reluctance, for I have made it a rule not to write upon a topic (unless that topic were purely theoretical) until I had a more or less complete knowledge of the same. To write an article on queen cage candy is to display too much naked ignorance. It is with the hope that I may offer suggestions or hints which will lead others to investigate along this line that I am at all willing to take on this topic.

We have for many years been led to believe that the "Good" candy was perfect if properly made. Properly made according to what Henry Alley taught me, was to mix cold honey with powdered sugar until a stiff dough was formed. This dough was to be left twenty-four hours or so upon the marble slab and then more sugar was to be worked in. Not less than one or two hours of labor were required to make enough candy for two hundred or so queen-cages. This labor reacted on me in such a way as to lead me to seek the same results by easier means.

First I tried warming the honey in a double cooker and stirring the sugar in until the dough was of right consistency. By this method one could make enough candy for one hundred cages in a few minutes. The next logical step was to weigh both honey and sugar until the right proportions were found, so that there would be no guess work.

About this time I discovered that one could make an excellent soft candy by cooking sugar and water with just a small amount of cream of tartar to the temperature to make a hard fondant, say about 242. This was cooled slightly, and then stirred. When it began to cream two ounces or so of honey were added for each pound. This gave a soft candy that would set. As soon as manipulated at all it would lose its set condition. Bees ate it very readily. All one season I sent out queens on this candy and had excellent results except that occasionally a queen and attendants would arrive all daubed up. A warm mail car would so soften this candy that it would flow. If made harder there was danger that a lower temperature would cause starvation. These difficulties led me to forsake that candy, though I still use it occasionally in experiment.

So I went back to the "Good" candy and studied it until I arrived at the following results: No set formula for this can be used because of honey variation. I found that anywhere from five to six ounces of honey to one pound of sugar would work, according to the honey. If the honey was heavy or almost gummy, then six ounces or even more could be used. If the honey was thin in body, then only five could be used. An average honey calls for about five and one-half ounces of honey to one pound of sugar. Exact weighing must be done, on good scales. One quarter of an ounce of honey either way will produce decided results. Three years ago I saved out four cans of honey from a good flow of light honey in an apiary of new hives and new combs, an apiary off by itself, so that the honey would stand a better chance of freedom from disease. I have used this honey for all my queen-cage candy since that time and I still have two cans left. This honey being uniform, I am able to be exact in making the candy.

I have said nothing about boiling the honey. If one lives in a locality where American foulbrood is rampant he should by all means boil the honey. He need fear no trouble if he is certain that no American foulbrood is near him. In my own case the apiary where the honey was selected has been free from all foulbrood of either variety ever since its establishment about five or six years ago. Also, I have introduced probably a thousand queens on this candy made from unboiled honey in my own hives without a sign of trouble. I therefore boil this honey only when customers request it. I feel confident that sufficient boiling to kill all American foulbrood germs will also be sufficient either to kill the queen en route or to render her subject to supersedure within 6 weeks. I feel confident that the boiling of honey for queen-cage candy should be condemned, and that every queen breeder should do one of two things. He should, if possible, get possession of honey which is assuredly free from disease germs, or he should use invert sugar in the making of his candy.

The problem of checking possible disease in one's apiary due to infection from queen-cage candy should be met at the other end of the route. We all desire queens possessing their full vigor. If we compel the queen-breeder to boil his honey we are simply bidding for queens of impaired vigor. What we should do is allow the queen-breeder to use the best food he can get, so that we can get the best queens possible. When the queens come we should assume all risk. If we wish to risk disease, then we should introduce the queen in the cage she came in. (By the way, who knows that the cage has not been handled just after some American foulbrood has been handled; and has the cage itself been boiled?) We are foolish to take that risk. The proper thing to do is to remove the queen from that cage and put her with new attendants in a cage stocked with food of one's own manufacture. Or we can put the queen at once in a push-in cage in a nucleus. The cage which came by mail can at once be thrown into the stove.

I have thus far been talking to no purpose, though such may not seem to be the fact. After all is said and done we have a large number of queens fail in a brief time. How can we prevent this early supersedure of queens that have come by mail? It must be possible, for occasionally we have queens come through the mail and live to a ripe old age. I recall here that practically every queen received from George M. Doolittle lived to give good service. Why did queens from him live into the second and third seasons, while queens from many a breeder would never see the second season? Was it entirely because Doolittle knew better how to rear queens? I doubt if that be the reason. I believe it was because Doolittle knew better how to mail queens.

I used to read all of Doolittle's writings and I recall one of his statements with great clearness. Doolittle said that in selecting attendants for the queen he always took those bees which, when the comb was taken from the hive, at once poked their heads into cells. These bees he said were nurse bees which had just returned from a play-flight. They were young bees and would, therefore survive the trip through the mails and take care of the queen until her arrival.

I wonder now whether Doolittle had any inkling of the real reason that those bees would do the trick. He evidently thought only of their youth, and hence vigor. I at this moment, had to smile to myself because I just recalled an article which appeared some months ago in which a queen-breeder told with much pride of his short cut in stocking cages with attendants. He imprisons a few thousands of bees in a box, the cover of which has a number of exits. He arranges a row of queen cages so that he can set them over these exits and allow the frenzied bees to rush into the cages. If too many get in, he lets a few escape. In this manner this queen-breeder is to overcome one of the heaviest of all tasks which a breeder has, namely: the stocking of one's cages with attendant bees. If that gentleman happens to read this article, let him think over his plan well! Yes, the bees that Doolittle used had youth and vigor, but what else had they?

A few years ago I tried an experiment. I thought I would try wintering a small swarm of bees upon candy alone. This candy, as I recall, was made by the hard fondant formula, which I have already described. A small box was made with two tops separated about two inches. The lower top, or what might be termed a false top, had several small holes in it. The space between the tops was filled with about six pounds of candy. The small hive was perhaps seven inches square by eight deep. In it was placed a swarm of some three quarts. As soon as the bees were quiet (it was late in the fall), the box was set in the cellar. It was set out once for a winter

flight. These bees wintered well apparently. They built four or five combs during the winter, the largest of which was nearly the size of your two hands outspread. To my astonishment, one of these combs showed clearly that several hundred worker bees had been reared during the winter, for a space of about the size of a man's palm had cocoons in the cells. The bees came out so strong that when the hive was tipped to be photographed, the combs could scarcely be discerned.

Surely, thought I, as I set them out in the spring I have here the making of a fine colony of bees. I was wrong. Although the bees appeared snappy and began at once to hustle in pollen they died like flies, and the queen herself disappeared after laying a few eggs. What did it mean?

In answering that question, what did it mean, I will first ask another. Where did the bees get the protein food in the winter to feed several hundred larvæ?

There was only one source. They had stored up in their bodies this food, and they robbed their bodies to feed those larvæ. Having robbed their bodies thus, they were for weeks unable to furnish the queen with a balanced ration. This caused her early failure. They themselves were weakened and died in the spring like flies. What is the teaching?

When Doolittle chose the returning flight bees for attendants he, I think, unwittingly chose to put in his cages some attendants which carried in their bodies a small quantity of larval food. This food was doled out to the queen en route and she arrived in a splendid condition. Contrast that with a cage of bees and queen in which the attendants are all old field bees. This queen arrives after deprivation for several days of a food essential to her health and welfare. Is it surprising that she is doomed to early supersedure?

It is said that no queen can survive a caging of two weeks or so and prove of value. Why is this? Is it not simply that the supply of food essential to her health is insufficient for such a length of time? I have known queens to remain caged in the hive for two and three months and thereafter live to do good service. Shall we say that this is because they could thus be supplied for any length of time with proper food?

We have here, as all my readers must see, the greatest problem connected with queen rearing and queen shipment. To be sure of good queens we must be sure that at no time is a queen deprived for any length of time of food essential to her health. To accomplish this is a problem. Right off the bat we see that all queen breeders must throw aside all such contradictions as nursery cages. All virgins must be given the range of the hive loose among the bees. This is assuredly true unless we can discover some ideal food which can be furnished the virgins in captivity.

I tried, in my own case, to furnish my virgins in the incubator with such an ideal food. I made a syrup for them of honey, water, and jelly from queen-cells. It did not work, the virgin queens ate so much of it that they got indigestion. Some of those virgins, when taken from the cages, looked like workers coming home with full honey sacs. There may be a solution here for some patient worker. Once find the ideal food and we can also furnish it to the queens sent by mail.

I have reserved for the last my final experiment. I have yet to learn how long the queens of this experiment will last, but I offer the experiment for the benefit of our industry. I have for years sent queens to England, and most of them arrive alive. Unfortunately, they live only a few weeks after introduction. I was sure the trouble was food. So, on the 11th of last September, I sent four queens to a gentleman in England, gratis, asking him to report condition on arrival. Next summer he is to report further about those queens. These four queens were put into cages with four feed holes and given twenty-four attendants each. An effort was made to select attendants that were young. The candy was made according to my regular formula, one pound sugar (XXXX confectioners') and five and one-half ounces honey. While the honey was warm I mixed thoroughly with it a fair percentage of royal jelly. I did not measure the amount, but simply used all I had, and would suggest that between five and eight per cent of the food might have been royal jelly. Here I felt sure I had a queen-cage candy which ought to stand the test. After several weeks I received a letter from the Englishman. I will quote from it:

"Dear Mr. Latham: The four queens arrived here on September 26, intact, with the queens and all the accompanying bees alive. Only a small proportion of the candy had been consumed, and as far as I could judge they could have stood with safety another week in the mails."

Please note that the queens were mailed on the 11th and arrived on the 26th. Fifteen days in the mails and apparently in perfect condition. Now if those queens do good work next summer we shall have pretty good evidence that the food question is the all important factor in queen shipment.

Some queens through the mails prove excellent, but most of them prove of little value. With the haphazard work of inexperienced employees it is easy to see that this is a perfectly natural condition of affairs. Little thought has been given to the fact that a queenbee needs a balanced ration. It is not merely necessary to keep life in a queenbee while she is in the mails. It is also necessary to keep value in that queenbee. A balanced ration of food will do the trick, other things being equal. I wish I knew more about this subject, and had expected to hold it up until further investigation, but have offered it only on request. Go to it, all my readers, and search out the truth.

THE MILLER MEMORIAL LIBRARY

To the readers of the American Bee Journal:

Do you want to help us in every way, every day?

Do you want to have a historical record of American beekeeping?

If so, help us to acquire as many old books, bee journals, letters of famous beekeepers, pictures, programs and other beekeeping records as possible.

We appreciate fully the money donations which have been made and urge that the effort be continued.

Please help us to secure old books and journals.

We have acquired several hundred volumes, but these constitute a very small number of the thousands of books and pamphlets printed.

If you happen to send in something duplicating what we have we will make good use of it by trading with someone for those things we do not have. And we wish to have in the library two copies of every publication, so that in case one copy is lost or stolen we will have a reserve to fall back on.

Send in anything which pertains to beekeeping, even though it be a page or several hundred pages. We do not have a single copy of some of the old American magazines, and have complete sets of none. We do not even have a complete set of Gleanings in Bee Culture and the American Bee Journal.

Please go through the old books in the attic, basement or barn and select out the bee journals; pack them in a box and send them by freight, collect. We will pay the charges. The University of Wisconsin is preparing a file of all publications, and at some later date a catalog will be prepared and published. If you wish to borrow some of these we will loan them to you through your library.

Keep this in mind. This library belongs to the beekeepers of the world. The University of Wisconsin is simply the repository. I am only acting as an agent in collecting the material and seeing to it that it is properly recorded and arranged. There will be others to care for it when my term is ended.

Perhaps you have several books of great value to the library, but wish to keep them for the present. Then perhaps you will forget entirely, and when you are gone they will be thrown away or lost. Every book or journal sent in will have your name as donor written on the book plate. These will be historical records. Will your name be in the history?

A historical museum for the entire beekeeping world is being built up. Help in every way you can to make this effort a monument to the beekeeping industry.

H. F. Wilson.

INSURED QUEENS

By H. A. Mark

Here is one who believes that an organization such as suggested by Mr. C. H. Smith, page 28, January American Bee Journal, can and should be put into effect. I will not call myself a queen breeder until I can be sure of producing the grade of queens I have been attempting to buy.

We have heard that a certain man gave this advice to his sons: "Boys, make money. Make it honestly if you can, but make money." Judging from queens I have purchased, some of this gentleman's sons, giving up all idea of making money honestly, engaged in the queen breeding business.

Since almost any breeder is able to supply the publisher with ample "evidence of his good faith and ability to supply such queens as he advertises," at the present time neither the publisher nor the beekeeper has any method or opportunity to know the difference in the goods furnished by these advertisers except to buy and try them out. And no matter what an advertiser would send to me, an unknown person in the beekeeping world, he would be careful to supply the publisher or any prominent beekeeper with a first-rate article—even if he had to buy it from another breeder.

In fairness to his advertisers, the publisher cannot say anything or allow anything to be said in his columns that will give a prospective buyer any idea of who are the best breeders. Neither can one judge from the extent of the advertising, the nature of the claims, or the price asked. No one is more justified (from his standpoint) in extensive advertising, high-sounding claims, stress of the guarantee, and a high price, than the seller who knows that he will not get a repeat order as soon as the quality of his goods are known.

Of what real value is the present "guarantee" to protect one against those who have gone into the queen breeding business with no other thought than to "make money"?

Last year, wanting breeding queens, but not knowing where to get good ones—the best—I decided to buy select untested and requeen all of my hybrids and to raise what queens I needed from my best colonies. I reasoned that he who furnished the best select untested would also furnish the best breeding queens.

So I looked over the advertising pages of the magazines and wrote to such breeders as had advertisements that appealed to me. With their literature as a basis, I ordered—not later than in January—one or two select untested from each, for early delivery. Two queens from a certain breeder were the best appearing of all received. I at once ordered from him all of the select untested I should need. Introduction was successful, most of them looked to be up to standard, and I felt I had made a wise selection.

A month later I was sure I had some mismatings, but did not want to make a complaint until I was positive. When that time arrived, to remove the queen and return her, as was required under the guarantee, would probably result in a honey loss. Since hybrids may produce as much honey as pure stock I decided to keep the queens and trust to luck that I did not get any mismating in my queen breeding from this source.

When the honey flow was over my best colonies had produced from 200 to 300 pounds of surplus. Two-frame nuclei, headed by 2-year-old queens of my own breeding, made at the time these purchased queens were introduced, had built up strong and made from 100 to 150 pounds of surplus. The early introduced queens from other breeders had given nearly as good results as my own queens. But the colonies to which this breeder's queens had been introduced had given very little surplus. The bees of more than half of the hives were small, inferior blacks and one-banded hybrids. Their drones had all of the indications of being pure blacks. I have only one recommendation for them: None of them swarmed or built queen cells—they did not build up strong enough for that.

Did I return the queens or make a complaint to the breeder? No! Mistakes and mismatings will happen. But when a breeder uses a breeding queen—or even has such a queen in his breeding yard—the daughter of a black queen, or the daughter of a hybrid that is the daughter of a black queen, he does not do it by mistake, it is not accidental mating. It is intentional.

A mismated Italian, or the daughter of an Italian that was mismated, will not produce uniform black drones. Hybrids can be bred up until it is almost impossible to find anything but three-banded workers, and may pass as pure leather-colored Italians, but the drones will not be uniformly marked. Hybrid descendants of an Italian queen may be bred **down** until the drones are uniformly black, but this uniformly black drone will not appear until long after all bands have disappeared from the workers.

Lying before me, as I write, is the advertisement of this same breeder, appearing in a 1923 publication. In this advertisement are the same old catch lines, "Three-bands," "The thrifty kind," "A guarantee that will protect." But now that I have had experience with his product, I realize that he does not use the word Italian in the entire advertisement.

Had we had such an organization as proposed by Mr. Smith, I could have appealed to them for advice and so prevented this self-deception. If there was such an organization now, it could be a clearing house for all of us who get "stung," and questionable breeders could be properly rated.

Oshkosh, Neb.

WINDOW ESCAPES

By B. Blackbourn

Some years ago I had a honey house fitted with windows somewhat similar to those described by Mr. Protheroe on page 558 of your December number. The glass was brought down to half an inch from the bottom of the sash. Outside, perforated zinc was fixed against the bottom of the window frame, and extended eight inches or so upwards about three-eighths of an inch from the glass. It is true that bees flying against the window would frequently alight on the glass and crawl upward, but sooner or later they would use their wings and buzz up and down the glass, usually finishing by a flop down to the bottom of the window frame, when they at once crawled out and up the perforated zinc. Numbers would do this on first coming in contact with the glass.

Though this arrangement was successful in clearing the honey house of bees, it had its drawbacks. On at least one occasion I lost a queen when removing her from a cage by her getting under the glass and away before I could grab her. Also, during a dearth of honey, the bees soon found their way down in the zinc.

If I ever build another honey house my idea is to have reversible windows hung by the middle so that with one push they could be completely reversed in the fraction of a second. any bees inside the window would be instantaneously ejected. I should then have separate openings, covered with wire cloth for ventilation which could be closed with a shutter. Robbers would hang round these openings attracted by the smell of honey and would not be hanging around the windows ready to fly in while those inside were being turned out.

One drawback to permanent escape is this: At the end of the season, or during a lull between honey flows, when extracting may be going on, or any honey exposed, a few bees may gain an entrance, and after filling up, leave again through the escape and return to their hives. The result is uproar in the apiary. If, however, the bees cannot get out, but are trapped, they will cluster on the window, and may be released late in the evening when any excitement that may be caused will soon die down as darkness falls.

England.

Value of Scarification

An article by H. Garman in a recent issue of the Seed World, gives the results of his investigations of the value of scarification of hard seeds. Seeds of sweet clover and of red clover showed an increased germination of from 11 to 15 per cent.

THE OLD STRAW SKEP

By A. H. Bowen

DESPITE the ever increasing popularity of the frame hive, with its many advantages, there still exists, in our country districts, the cottager whose faith in the straw skep is as stout as ever.

And, in the more out-of-the-world hamlets where progress is comparatively slow and education in rural pursuits unsought for, there can be found bee gardens of straw skeps, kept in the same time-honored way, and among as quaint surroundings as ever they were known in by-gone days.

Straw cap in place. The hives have been plastered to stone bases to keep out robbers.

Around the keeping of bees on these lines there has arisen, as might be imagined, bee-lore of an original character, passed faithfully down from times when the habits of the bee were more obscure than now, and he who is a patient listener can glean much interesting information from the old skeppist when in a talkative mood.

The dome shape is warmer than the cube, and thus the "peaked topped" hive is preferred to any other shape. In construction it is usually larger and stouter than the loosely woven factory built ones sold for taking swarms.

This makes for additional protection and warmth in winter time.

Very often skep-making forms a winter evening recreation, and great pride is taken in the finish and solidity of the hive.

The straw is secured from neighboring farmers for a small sum and the briars with which the rounds are bound together are cut from the bramble hedge. During a hot spell the skep is sometimes enlarged by means of a "rear." This consists of some five or six rounds of straw and is slipped under the hive to increase its storage space.

Sometimes, small hives, called "caps," are placed over hives possessing a hole in the top.

The "virgin" honey secured in the straw super is highly prized, and it is generally retailed among the gentry of the village at a remunerative price.

Feeding or nursing up stocks is rarely practiced in the bee garden, so that the less robust and thrifty type of bee soon dies out, and the beeman is thus saved a good deal of trouble and expense.

To protect the skep from the weather, a straw thatch in the form of a hackle is used. It does not harbor mice or lice, as do old bags, and the like; and a portion of the eaves in front is neatly clipped away to give the bees clear access to and fro.

The earthenware lichen covered bee pan is not now often seen. It is the heaviest covering of all, and when the hive becomes aged the combs are pressed so closely to the stone that the entrance is often in danger of being closed altogether.

Swarming time

The swarming season has in store a busy time for the skeppist. Those of the hives that have wintered strongly show signs of over-crowding when the hawthorn blossoms are profuse in the hedgerows.

The familiar sight of the bees "hanging out" in the hot sunshine arouses the beeman to action.

Skeps which have done duty during the winter as nesting places for the hens, or as potato sieves are hastily reclaimed.

And lest the bees should find any fault with the hive interior, it is first well scrubbed out and then "dressed" with a strong mixture of ale and bruised elm or currant leaves. He would be a bold man who would dare to omit this essential practice, for the bees are said to appreciate the qualities of good ale—bad ale, as likely as not, will cause the bees to abscond to another hive.

Then the sticks are placed crosswise inside to support the bees, and hold the tender waxen combs in place.

This done, the beeman awaits the arrival of prime swarms, second swarms or "casts"; "cuts"; senarts, and until the "staddles" or stands are all full. Should the season be "catchy" or "dabbley," some will fly

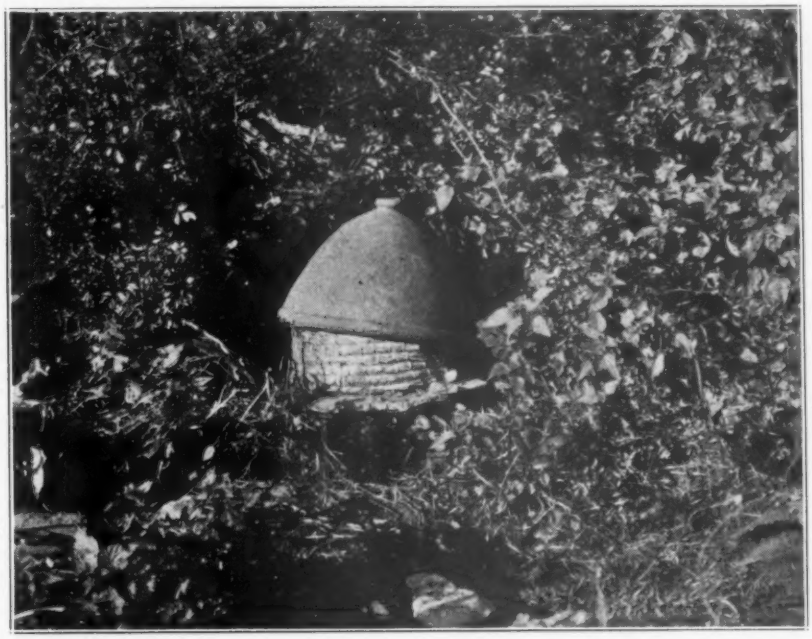
Typical cottage in the Cotswold Hills.

straight to the woods. But they are never followed.

To bring them back would cause a blight to descend upon the bee garden, and bad luck would dog the steps of the beeman.

Why the Sabbath is such a favorite day for swarming no one can tell, but as certain as the mellow tones of the church bell come up the village, it will mingle with the tuneful murmur of the bees as they swarm.

So, in the cool of the evening, the newly-hived swarms are made comfortable where they stand, for where the queen has chosen to alight there she must stop.



The skep with its bee pan is an interesting relic of the days when making pans was a local industry.

Taking the Honey

I wandered up the uneven cobbled path leading to the row of skeps under the bramble hedge to where a dusky figure was busy in the gloaming, and while the air was still sweet with the perfume of stocks and pinks.

"Taking up" time had arrived. The flowers were past their prime and the honey harvest was about to be gathered in. Was it not a privilege to be invited to assist? First the pits had to be dug. Then the sulphur matches, made by dipping squares of brown paper into liquid brimstone, were stuck into the cleft nut sticks, and stuck firmly, one in each pit.

"Now we'm ready. I've 'efted 'em 'to'ther night an' they'm most 'on 'em 'eavy. We'll take this un fust. Light the match. Now, off with 'em; an' clap 'im over.

"Them bags 'll keep it in. They'm a roaring smartish. Most an' gen'lly they does if the match is a good un."

And so the work went on in the darkness until the hives had been carried indoors away from the sulphur air.

For days the odor of honey is strong in the cottage as it drips slowly from the combs. Then there is metheglin to be made, and beeswax to be rendered. And the wasps! They infest the kitchen and crawl about, gorged and sleepy, so that by one means or another the cottager's wife is constantly getting stung.

But out of doors bottles of stale beer hung by the hives keep the invaders down, and a cement-like mixture is plastered all round the stove to keep out the robbers. There is much to be said in favor of the bee skep as a healthy home for bees, and the cottager derives both pleasure and profit from its use. He is hard to convince that wooden hives are ever as warm as his own stout hives. Maybe he is right. And who shall not say that the old bee skep, having served its purpose so usefully shall not be entitled to remain untouched and undisturbed, to still add its quota of quaintness and charm to the quiet work of the cottage garden, in its rusticity and old-world arrangement?

Cheltenham, England.

Corner in English bee garden. Note the miscellaneous coverings.

Honey In Radiator

About honey in radiators, we have the following experience: Gallatin Valley Honey, half honey and half water, if boiled together for several minutes, does not freeze until the temperature goes lower than 20 degrees below zero. Same mixture put outside, in a glass jar, showed no ice, but at 44 degrees below zero was frozen; but by examining same we found that it would do no damage if left in the radiator at that temperature, for it was still soft. We have been using this winter one part honey to three parts water and find it very satisfactory, much better than any other anti-freezing mixture sold in the market.

We use two trucks, every day, one Dodge Brothers and one GMC., and start out with them at 8 o'clock in the morning, but we never worry about the weather, even if it is 50 degrees or more below zero, for we know our radiators are all right, and as long as the gasoline does not freeze we expect to be back on the minute.

Chris. H. Buitenhoff.

(This confirms our suggestion of boiling the mixture.—Editor.)

DOES BEEKEEPING PAY?

By W. A. Shelly

"DOES beekeeping pay? Can a beeman rear and educate a family and give them a fair start in the world?" Page 21, January American Bee Journal.

After studying the question for twenty-five years, I have come to the conclusion that it will be the exception rather than the rule with the present generation of California honey producers. I have read of men who made money producing honey, but have never been personally acquainted with but one beeman who made his living entirely from honey production. Mr. William Muth-Rasmussen was one of California's early beekeepers and followed beekeeping all his life; and he was a bachelor, and very economical in his habits I do not mean to say that I have never been acquainted with a man who owned bees that was prosperous, but where they were prosperous they had some other means of making money. I should not consider that a man who was situated so as to retail his honey crop was making money entirely producing honey. If a man, on account of his location or his ability, is able to produce one hundred sections of comb honey and sell all he could produce at 20 cents per section, I believe he could give as many as half a dozen children a fair start in life. But in my county I have known of only one season when the average for the county was over forty-eight sections per colony, and in the twenty-five years I have been producing honey, the average price per case of twenty-four sections, has been $2.50 per case, or less. More over, our valley is situated on a narrow-gauge railroad, where supplies cost as much or more than any place in the United States and it costs 23 cents per case, local freight, to get our honey out onto the main line. On the other hand, we do not have to depend on rain ,and I never have failed to produce a crop in this county. Taking it altogether, I I would just as soon chance it here as any place in California, and up until four years ago (with the exception of two set-backs I had) I can say that I was doing pretty well. I always managed to get enough money to clothe and feed my children (half a dozen); in fact, at one time I got entirely out of debt and stayed in that happy state for 'most two years. I was also able, one year, to help my son, who was working his way through college, with two hundred dollars. And only one year, during the whole twenty-one, did my creditors get so anxious that they attached my crop before I could get it sold and my bills paid, or partly paid.

But those good old years seem to be past. Three years Co-operative Exchange, followed by a year when it cost me more to produce my honey than I was able to sell it for has dealt me a blow that seems likely to be fatal.

I have read, with considerable interest, the letters appearing in the American Bee Journal, but what strikes me as queer is that no one gives any definite figures on what it cost him to produce his crop the past season, or what he in return received wholesale for his honey. As far as any writer seems to want to go, is to make "estimates." One party gives some figures, but not enough to prove that he can make a profit on 8½ cent honey, where forty pounds per colony is produced Probably he can if he can produce it at $2 per colony, but he has got me beat. It cost me more than one-third of that amount to requeen alone, the past season. Also, I can't compete with a man that can produce two hundred sections of comb honey for $6, as it cost me, to put on board the cars this season, $23.75 for every two hundred sections I produced. Even the editor, who undoubtedly knows exactly how much it cost him to produce last season's crop and exactly how much he received for it, passes it over and says that he has never had any trouble making beekeeping pay. I, for one, would like to see his costs for one season and what he produced.

The following is copied from the "Western Honey Bee":

"Editor W. H. B.—What did it cost to produce a pound of honey in 1922? I find that my crop has cost an average of 6½ cents a pound. Here are a few of the costs: Cans and cases, 1 cent per pound; extracting and all trucking and handling of honey, 2 cents per pound; other expenses, such as rent, wages, use of auto and depreciation, 3½ cents per pound.

Other localities and conditions would, of course, make a difference. The above is based on 400 colonies producing 20 tons.—R. E. Lusher, Pasadena, Calif."

The above looks pretty nearly right to me. I see he makes no mention of interest and that is an item of expense a man is likely to overlook unless he has his bees mortgaged and has to pay out the interest on his investment.

As no one else has seen fit to tell his family secrets, here goes for mine. The following is what it cost me to produce my 1922 crop of comb honey, and what I received for it:

Supplies, including $160 upkeep expense	$ 910.00
355 days labor at $4 per day	1420.00
Interest and taxes	550.00
Rent on bee location	175.00
Truck expense during honey season	100.00
Total	$3155.00
Sold 1100 cases comb honey at $2.50 per case	2750.00
Loss	$ 405.00

So, you see, one hundred days' work was done that no money was received for. Moreover, one generally expects a little more than wages and interest. Also my truck expense is smaller by half, than generally, on account of turning it into a school buss for nine months of the year. Also, $160 is less than the annual amount of depreciation. However, I will say that this is one of my bad years. Another bad year was in 1920, when I turned $4,000 worth of extracted honey over to the California Co-operative Money Exchange and received an advance of $2,500. At the end of the year I got a red ink statement for $2,159. It cost me $3,500 to produce the crop. I received $341. Impossible! you say. No, it is a fact. The California Co-operative Honey Producers' Exchange in 1920 spent ninety per cent of nearly a million dollar honey crop advertising and putting it on the market. We had three years' exchange. Another poor year was the first time American foulbrood got me, about nineteen years ago. American foulbrood cost me $3,000. Another when European foulbrood arrived here at a time when the Government bulletins were advocating treating the same as for American. I had to practically start beekeeping over again, loss $2,500.

Well, getting back again, why did not my 1922 honey crop pay expenses? Was 355 days' labor too much to expend on 500 stands of bees? One hundred and five days each for two men was spent in the yards between the time the first queen cells were found and the first of November. I will admit that this is more time than is generally put in, but I produced 55 sections per colony, against an average for the county of 35 sections and have my bees in condition so that I know I can make the same percentage next year. One hundred days' work was spent outside of yard work doing whatever work there is to do in taking care of a comb-honey crop and repairing all equipment, etc. Forty-five days' labor were put in during the winter and up to the time the first cells were discovered. I do not expect to handle my next season's crop with any less work. Was the crop first-class? It was. Alfalfa and sweet clover, white and light amber, 60 per cent fancy. Did I sell my crop too cheap? I did, but I sold for the best price I could get. Two cars that were held for better prices sold one at 10c per case less, and one at 15c less. Would extracting pay better? No; the best price that was offered for extracted was 6c, and the ones that didn't sell for that, sold later at 5c. A few years ago a beeman here who extracted, bought hogs and fed his honey to them because he could not get 4c f. o. b. Did I pay too much for supplies? The supply dealers say not, but it makes one wonder sometimes how one of our supply manufacturers accumulated his millions in the last 50 years—perhaps producing honey. Why have I stayed with a business all these years that has not paid? Well, with me, and I suppose it is the same with

other beemen, I have always looked for the luck that lurks just around the corner. Also, there is a fascination about beekeeping that is hard to overcome. Do I intend to still follow the business? Oh, yes. I am taking a fresh start, hoping that the cost of production will go down and the price of honey come up.

The editor will probably say, "Pessimistic." No. I say "Optimistic." Every honey producer that stays with it has to be.

(Mr. Shelly gives costs of producing a crop under his conditions. In the east we get higher prices with less freight to pay, owing to nearby markets. It would be interesting to compare cost of production under widely different conditions,—F.C.P.

DOES BEEKEEPING PAY?

By Hy. W. Sanders

Of many replies to this question published in recent issues of the American Bee Journal there was but one in the negative, the letter from G. F. Marsh in the December issue. The gist of his contention is to the effect that a beekeeper would have to invest $12,500 for an outfit of 250 colonies, and that a crop on an average of 90 pounds of honey per colony would bring in only $2,500, of which $1,250 would have to be charged to interest and depreciation at the rate of 10 per cent, leaving the operator only $1,000 for all his expenses in addition to his year's labor. The $12,500 mentioned is to cover 250 colonies of bees, with three supers each, buildings, a car, a truck, extracting and wax rendering appliances, etc.

The figuring reminds one of the dairymen who were investigated some years ago by the farm cost-accountant from a certain Agricultural college. He made careful enquiries and worked out production and selling costs by which it was unquestionable that they were losing money, and like the beekeeper in the above theory, would be better advised to "put their money into bonds and go and work at day labor." Only somehow the dairymen seemed fairly contented in spite of it all. Several had just built new barns and houses out of their losses. All were developing better herds and raising healthy families, and some were putting money away in the bank. It was evident that there was a discrepancy somewhere between theory and practice. The explanation, of course, was that in the cost accounting, charges were made for interest and depreciation that was never in fact paid out at all, and that every hour of the dairymen's long hours of labor was charged for, as well as that on the part of their families, the same as it would be in a factory. On these figures there was no money in milk.

It is somewhat the same with beekeeping. If one were to charge up every hour spent at "union rates." interest on the capital, cost of all appliances as well as "out of pocket expenses," then it is possible that many that they can combine the operation of our best beekeepers might find a theoretical loss on their year's operations. Very few, if any, I imagine, would want to sell out, put their money into bonds and work at day labor, for the simple reason that many of the best things in life cannot be measured in terms of dollars and cents. There is a certain freedom and fascination about beekeeping that keeps men in the game in bad years and good, as long as they can make a living out of it, and to be a real beekeeper the interest in the work, and the development of systems of management provides an incentive that makes their work happy, where "day work" even for higher wages, would be an intolerable servitude.

Even, however, if we disregard these considerations and keep the question down to a level of money alone, there are a number of things about the calculations in Mr. Marsh's letter that need examination. To begin with, what does he want a car for, as well as a truck? For a 200-colony outfit a Ford 1-ton truck ought to be ample for all purposes, and if bought second-hand it need not represent any very great outlay. Then, again, he figures three supers per colony, yet only calculates for a crop of 90 pounds per colony. In actual practice that would mean that his supers would never be even filled once by the bees. Most practical beekeepers can make from two to four extractings from each comb in the season. Therefore, two supers, and in many cases only one, would suffice. (The extra supers are necessary for the exceptional season.—F. C. P.) Then, again, he mentions wax-rendering apparatus, yet never figures wax in his returns. Surely if the wax doe not even pay interest and depreciation on the wax apparatus, it would be better to throw it away and not bother with it at all! Then, again, most beekeepers sell bees, and that is not reckoned in the calculations.

In practice, how often does one come across a man who starts out with $12,500 in real money, proceeds to sink it in bees, and makes a success of it? We have most of us seen people try, but very few remain beekeepers. The successful apiarist almost invariably starts small and builds up slowly. The couple of colonies are his hobby and study. Then in due time they increase to eight, ten or twenty. Seasons pass by, each giving the beekeeper its quota of experience in managing bees. Then the honey money begins to figure seriously in the income and the question arises as to whether beekeeping shall be his principal business. During this incubation period the bee business has financed itself. The honey income has gone out for supplies or machinery. Bees are sold in spring and used to finance the season's containers. I have seen men build up nine apiaries in this way in their spare time without the outlay of a cent, outside of the regular profits of the bees.

In some cases men are so situated of their bees with some other occupation, and take off only such time as is actually needed in the season. These folks can continue to permit their bees to capitalize themselves in the way above outlined. In other cases there must come a time when the apiarist must take a plunge and give up his accustomed occupation to depend altogether on the bees for a living. Here he may have to sink his capital, and it is at this stage of the game that he needs to be very cautious. There is a certain point beyond which the increasing of the number of colonies may not be profitable, but on the other hand, there is no reason why they should not be increased up to this point of maximum efficiency. Just where the limit must be placed depends on the locality and the beekeeper.

A thoroughly efficient, able-bodied beekeeper, who is content with a crop of 22,500 pounds, for an entire year's work is either in a very poor locality, or he is not managing things very well. In Mr. Marsh's letter this is the figure he mentions, 250 colonies giving an average of 90 pounds each. With all those supers it would be better to run the apiary up to 400 colonies and so raise the crop, on the same average per colony, to 36,000 pounds.

His crop is figured at being worth only 10 cents a pound, without containers. But if the man has no other business, what is to stop him from putting in his spare time during the winter in bottling this honey and getting a retail price for it? If he knows how to produce and put up good honey he can soon work up a business where he can average nearer 20 cents than 10 cents a pound, in small containers. If he were to raise his average crop to 36,000 pounds and get 20 cents for it, the profit and loss account would show a much more respectable figure.

Beekeeping needs something more than the investing of money. In this respect it is like poultry raising. There are men who make a good living from poultry, yet around every large city may be found elaborate and abandoned poultry plants that have been put up by folks who lost their money. A rich man who had financed one of these for his son once remarked to me: "They say there is money in poultry, and I know there is, for I put it there." It is something the same with bees, and the man who goes into it without the most thorough experience and knowledge may well arrive at the conclusion that it does not pay.

California.

Paramning the Honey Extractor

Mr. Allen Latham has a method of protecting the inside of his honey extractor and keeping it cleaner than is possible in ordinary use. He coats the inside of the machine with paraffine, thus protecting the surface and giving it a waxy coating from which honey runs off readily. The extractor can be emptied much cleaner in this way, according to Mr. Latham.

THE MARSEILLE CONGRESS

By C. P. Dadant

WE are in receipt of the official report of the International Congress of last September by Professor N. P. Kunnen, of Luxemburg, which was kindly translated for us by Mr. Geo. E. King, of the University of Illinois. As the account given of the congress by Mr. Vaillancourt, which follows this, covers nearly all the points, we will not publish the official report, but only wish to mention interesting points not given in the Vaillancourt account.

This Congress was the sixth international meeting of beekeepers. The first was held at Brussels in 1897; the second at Paris in 1900; the third at Herzogenbusch, Netherlands, in 1902; the fourth in Brussels in 1910; the fifth in Turin, in 1911.

In the discussion on improvements to be made in bee pasturage, it was suggested on every side that city governments be requested to plant honey and pollen-producing trees along the streets. This was interrupted by Dr. Rotschy of Switzerland, who exclaimed: "Beekeepers, help yourselves and do not depend upon governments to do the planting." Tombu replied to this that the Belgian government had already done a great deal in the planting along the streets, of trees that contribute to bee pasturage. To which Dr. Rotschy replied: "Then you have a good queen in your political bee colony."

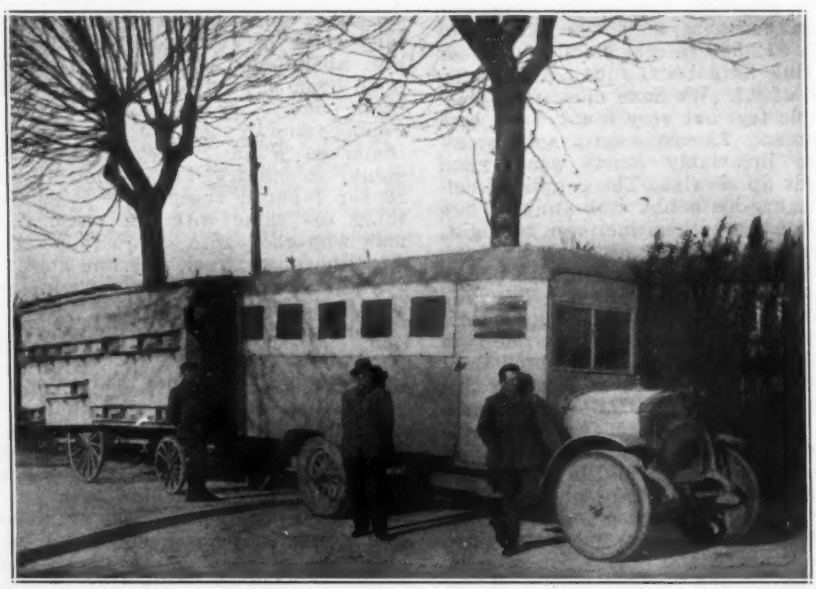
Mr. Vaillancourt is reported as giving a very interesting account of the teaching of beekeeping in Quebec, which he modestly omits. He said in part:

"We tell the people of the pleasantness and the poetry of bee culture and of the value of honey as food. We express it in the simplest language, avoiding all learned and technical expressions. We distribute, gratis, a textbook, Le Rucher Quebecois. We circulate pamphlets and utilize lantern slides and films. We are experiencing a steady growth in our conventions. We have 25 bee inspectors employed, one for each district, that are empowered to examine the bees. Before anybody can receive an appointment as bee inspector, he must complete an apprenticeship and pass an examination. The bee inspectors work 100 days annually. They receive their traveling and living expenses and five dollars per day. Since 1914, when we first became intensively interested in bees, the Government of Quebec has set aside $30,000 annually for the promotion of beekeeping. Our beekeepers' associations are joined together in a Provincial society, and each association sends two delegates to the joint committee. In girls' boarding schools, and in the domestic science schools, instruction is given in beekeeping. In the French Province of Quebec, we have as many lady as men beekeepers. You know that when the women undertake a thing themselves, the men follow them." Preliminarily Mr. Vaillancourt had said: "My name is Vaillan court, so I will be 'vaillant' and I will be 'court'" (short). Whether he was short or not was not noticed, because his remarks were so interesting and his address so valiant and spirited.

A resolution was passed requesting every government to make laws forbidding the use of the word honey for anything but pure honey; the designations of "improvised honey," "artificial honey," etc., being already prohibited in France.

A recommendation was made that, in future, international congresses be arranged in sections, with a secretary in each section entrusted beforehand with the business proposed, to be arranged in a concise form, the substance of it to be given out and distributed to the members, so they may be prepared for the intended discussions. This would simplify the work.

The bee industry exhibit, which was going on simultaneously, was extremely profuse and most elegantly arranged, fulfilling the requirements of the French program, which called for "harmonious arrangement, original ideas, displaying at full value, in a becoming manner, the renowned products of the bees."



Apiary of 40 Langstroth hives on wheels near Marseille, France. Property of Mr. Baudin, who, with his sons, conducts several apiaries.

SIXTH INTERNATIONAL CONGRESS OF APICULTURE

By C. Vaillancourt,

Editor of L'Abeille, Delegate for Quebec.

This Congress was held at Marseille, September 18-20, 1922.

Marseille is a maritime city of about 800,000 inhabitants. The people are very talkative and the animation of the city is most lively. On arriving at Marseille, one would think oneself in a real beehive, in which the bees worked with extraordinary activity. The people of Marseille have the reputation of being great fibsters, but that reputation is overrated. But what cannot be overrated is the proverbial warmth with which we were received. I hope we may be able to do as well, when the opportunity offers itself.

The Congress opened on the 18th of September, under the presidency of Mr. Sirvent, President of the Apicultural Society of the Bouches-Du-Rhone. The Vice President was Mr. Sevalle, Secretary of the Central Society of Apiculture. This gentleman is also the director of the very oldest bee magazine, "L'Apiculteur," of Paris. The Secretary was Mr. Leon Tombu, Perpetual Secretary of the Permanent Committee of International Congresses. Mr. Tombu is a Belgian.

France, Belgium, England, Italy, Switzerland, Poland, Luxembourg, Greece and the Province of Quebec had sent delegates.

All the sessions were held in French. The opening session was consecrated to the organization of sections, a chairman being named for each section; breeding, colonial apiculture, teaching, economical and prophylaxis sections.

In a beautiful speech, the President gave us an outline of the proposed work of the Congress, and directions which would certainly have given better results if all the members had only followed them.

The first morning meeting ended in a banquet; at the moment of the toasts, a little incident took place that drew a most biting repartee from a witty beekeeper. A newspaper man was present, who raised his glass to the success of the meeting, but wished that honey could be sold at a lower price, so that he might be able to eat more of it. "At Marseille," said he, "we sometimes pay up to 10 or 15 francs per kilo, for this delicious sweet." Protests broke

out. Some were even getting angry, when the witty Abbe Eck answered: "Do not make us pay so dear for your advertisements and you will be able to get our honey cheaper." This reply had the gift of bringing back good humor and the banquet closed with a toast to the prosperity of apiculture and the health of the apiarists.

The afternoon session was devoted to the section of "breeding," the best means to enrich the melliferous blossoms and the possible output of colonies.

The first sitting of the second day was employed by the section of French Colonial Apiculture. As this subject would be of little interest here, we will pass it.

In the afternoon a session was held, long, laborious and too overloaded to allow a profitable discussion of the subjects presented. At first they discussed the best methods of teaching apiculture. A summary of two reports from America was read, from Dadant and Phillips, a report from Belgium, by Thibault, and a French report drawn in collaboration. Each of these submitted ideas, but there was no time to discuss them. As a conclusion, however, all seemed to prefer teaching by images, or lectures with moving pictures. One delegate said that we must form masters before we can succeed with pupils. Mr. Sevalle expressed dislike of lecturers, who, he said, are only prattlers, and he preferred professors. In America, if we leave the diffusion of apiculture entirely in the hands of our agricultural schools, I am afraid our gain will not be as great as our losses. It is perhaps the same in other countries. Let us select competent lecturers and everything will go for the better. If apiculture has developed so well in Canada, and if box hives are practically out of existence, we owe it to our lecturers.

The Abbe Metais, pastor of Ste-Soline, proprietor of a rather extensive apiary and a devoted apostle, told us about the beautiful work of apiculture which he teaches to the children frequenting his school. Father Metais has, according to my opinion, the real method. Let us begin by instructing the children, boys or girls. If they become interested, tomorrow they will be, if not so many beekeepers, at least so many honey consumers. Mr. Thibault told us that we must not wait for the children to come to us, but we must go to them.

Doctor Labarthe told of what the society of Toulouse is doing, saying that there is a course of four months given, then intercommunal competitions, etc.

Mr. Roche stated the post office bureau will put a car at his disposal; it will be similar to our school car that went around Quebec Province last fall.

Mr. Sirvent spoke of apicultural literature and deplored the fact that some editors allow the publishing of articles recommending the use of box hives, without frames.

Some of the foreign delegates were asked to expose their ways of doing things, each one for his own country. The first to speak was the English delegate, J. Herrod Hempsall, editor of the British Bee Journal.

Afterwards came the turn of your humble servant. It is useless to repeat what I said. You all know what we are doing for beekeeping around here.

Mr. Mayor was President of the Economic Section. Messrs. Giraud, Tombu, Mayor, and Alphandery spoke primarily on the transportation of queens and bees to avoid mortality as much as possible. It appears that, in Europe, the service of postal delivery is still slower than ours. This slowness is the cause of many fatalities among the bees.

The sitting continued with the discussion of the best means to advance the sale of honey. Messrs. Grenier and Blone insisted on the value of honey fairs, and that it would also be necessary to advertise in the newspapers in order to reach the consumers. They said that no apiculturist should send a jug or a jar of honey without sending along with it a paper or tract giving the beneficent properties of honey. Others spoke of the making of mead, the drink of the gods. This delicious drink would be a great outlet for honey and could be drunk with profit to our organism, instead of the many vile drinks sold in bottles which only destroy the strength and energy of our bodies.

Mr. Sirvent presiding the International Congress.

Mr. Sevalle specified the kind of advertisement required to attract buyers to apicultural exhibits, without which we would be losing our time. Mr. Mayor told us of the success obtained in Switzerland. Mr. Sirvent spoke of the uses of honey transformed into alcohol for a liquid fuel.

A delegate proposed that this subject should be especially treated in the next Congress. Several delegates thought it a bit of prodigality to thus use honey, and Doctor Rotschy said that, instead of using honey in automobile radiators, we should see that the hospitals were well supplied with it to help the sick and sufferers.

At the beginning of the next session, Mr. Alphandery presented a report upon the customs duties imposed upon honey and beeswax.

The last meeting of the Congress took place on the 20th, in the forenoon. This sitting, presided over by Mr. Philippe Silvestre, was mainly devoted to bee diseases. Two masterly reports were presented by Dr. De Rathsamhausen, of France, and Dr. Morganthaler, of Switzerland. The former recommends the formation of centers of study, information and observation, to combat diseases among bees. The Swiss delegate gave us a summary of his scientific work, which we will be pleased to publish some day. Then came the discussions. Some held that foulbrood may be cured, others that it cannot be cured. Several demanded apicultural legislation, which is certainly desirable in the countries that have none.

Then came the moment of the drawing of resolutions, and the choice of the city in which the next international meeting will be held. The contest was between Geneva and Quebec, and Quebec, fortunately for us, was chosen.

A banquet closed the Congress; as usual, the greatest cheerfulness reigned all through it.

The following day, we made a fine excursion into Provence, the native country of Mistral. We visited two beautiful apiaries belonging to Mr. V. Baudin. The first was composed of Dadant-Blatt hives, and the second of ten-frame Langstroth hives. Moreover, we saw a movable apiary placed on a wagon. This apiary, composed of 40 colonies, 20 on each side, permits of pastoral apiculture. As in every other place, we were received in the most amiable way by Mr. Beaudin. Having had the advantage of making this excursion by automobile, thanks to the kindness of Mr. Charles Ranque, we were able to enjoy some of the magnificent views of Provence.

The reproach that we can make to this Congress is that it was overloaded with its program, for the length of time we had. In the next Congress it would be better to study two or three subjects thoroughly and draw therefrom some ripe conclusions. Many works cannot be studied, many subjects cannot be examined for want of time. We would have needed at least two weeks to discuss all the subjects submitted.

As the next International Congress will take place at Quebec, we need your help, and I am quite sure you will not refuse this favor.

ADVERTISING HONEY IN YOUR LOCAL PAPERS

A short time ago we were sent by Mr. C. H. Wolfe, of Colorado, a series of "Honey Talks" which he had inserted in his local papers to stimulate the demand for honey in his locality. Mr. Wolfe accompanied his talks by description of his honey and its prices, and reported the series of talks a decided success in helping dispose of his crop.

We have long felt that some such a series would be a fine thing to distribute to our subscribers for their use in the local papers.

Accordingly we had Mr. Wolfe rewrite this series so that they would be suitable for any locality and might be furnished to the local papers either as an advertisement which with prices of honey might be paid by the beekeepers, but more particularly as news items to be printed as such oy the publisher without charge.

By special arrangement with Mr. Wolfe, these articles may be signed by the local beekeepers, if desired, or may bear the name of the original author, Mr. Wolfe.

Below we give, verbatim, one of these "Talking Honey" series, as follows:

(No. 7)

There is as much difference in various kinds of honey as there is in the butter of different butter-makers, or the milk from different dairies.

Part of the difference is due to the skill and care with which honey is produced and marketed. Honey can readily be ruined by carelessness and indifference on the part of the beekeeper.

The honey gathered from various flowers has all the difference in the world in flavor and eating quality. For example, honey from dandelion is so strong and yellow as only to be fit for bee feed. Honey from tobacco plants, which yield nectar abundantly, tastes of the tobacco. Buckwheat yields a heavy, dark, strong-flavored honey which many people like; others do not. Some southern flowers yield a dark honey of exceedingly fine flavor. Goldenrod yields a beautiful golden honey of fine flavor, somewhat stronger than the lighter honeys. Honey from horsemint carries a decidedly minty flavor.

You see, you can't always judge honey by color alone.

The clovers, inter-mountain alfalfa, white, sweet white, and sweet yellow, basswood and raspberry, and the California white sage, as well as orange are the finest honeys produced in the whole world.

Every locality where honey is produced has its own "best" product, which the people of that community have learned to relish, whether the honey be light or dark, mild or stronger-flavored. Such honey, if produced under favorable conditions, is good honey, regardless of color.

A NANTUCKET BEEKEEPER

By Josephine Morse.

Mr. M. F. Freeborn has kept bees on the island of Nantucket for 45 years. He is a real beekeeper—not only because he is a successful honey producer with 14 colonies of bees in a very clean and well-kept apiary, but because he really loves his bees and enjoys working with them. His average yield of honey is not large, for though there is a constant succession of bloom on the moors through the summer and fall, the early bloom from maples, willows, etc., and later from fruit bloom, is lacking, and the bees get a very late start. Trees grow only in the town proper, where the buildings furnish protection from the winter winds, and of course there are no orchards and no supply of nectar from such sources to produce a surplus. The main honey flow is in the fall from goldenrod. Other sources of nectar are the cranberries, some clover, wild clematis, clethro, wild asters and perhaps heather. The blend of honey secured from these various blooms is very delicious. Visitors to the island from all parts of the United States, having once tasted Nantucket honey, become regular customers. Until the last few years, Mr. Freeborn has been the only beekeeper on the island, and at present there are not more than four or five other colonies kept there beside his own.

No disease has ever been found, and it is unlikely to occur on this island 30 miles from the mainland and in an apiary which is so well managed.

Mr. Freeborn misses the contact with other beekeepers which is obtained at meetings of beekeepers' organizations on the mainland. Most of the visitors to Nantucket are summer tourists, purchasers of honey often, but seldom keepers of bees. So the few beekeepers who do visit Mr. Freeborn's apiary receive a doubly warm welcome and are sure of an exceedingly pleasant and interesting "bee talk."

Massachusetts.

A Nantucket beekeeper and his bees.

THE HUBER LETTERS

Functions of the Queen and of the Workers

Lausanne, July 31, 1829.

(Continued from February)

1. The queenbee is, as you know, to the letter, the mother of her people.

2. You are aware that she has two sorts of eggs to lay.

3. That it is the part of the workers, whom she rules, to construct the cells in which they are to be reared.

4. The cradles of those young are of different shapes and sizes, and disposed as most convenient for the usage which they are to fulfill.

5. You have not forgotten that the queen knows, or seems to know, the sex of the young which she is about to lay, of which we have made sure by noticing that it never happens, except in rare exceptions, that she lays drone eggs in cells intended for workers, nor the egg intended for a worker in a cell made for drones. This observation of Reaumur excited against him the feelings of his country women neighbors, who were disinclined to believe that a simple "fly" could be gifted with faculty of which they were deprived themselves.

6. You have seen that the queen-mother limits herself to giving birth to the young, but gives them no care; it is to the workers that the duties belong which are in other beings exclusively entrusted to the mothers. Their task begins at the moment when the young larva tears the membrane which kept it imprisoned during the three first days of its ex-

istence. It is in the anthers of flowers that they find the first food suitable for their young; they know how to proportionate the dose of it to their age, to their digestive strength and to their other needs, The milk of the first days is at first flat, it acquires a better flavor on the following days. The pollen, whatever be its origin, like the milk which serves as first food to animals and to us, must be eaten, digested and elaborated within the breast of the nurse. It is the pap intended for the royal larvæ that our taste perceives more fully the differences which we note and which prove that this admirable arrangement is one of the positive laws wisely ordained by kind Nature.

7. You ask me what honey is. The Ancients had judged by its sweet flavor that it was a true nectar and they had given it the name of the glands which are found at the bottom of the calyx of flowers; vegetable physiology and chemistry do not give us any further information. If we cannot yet say anything more positive on its nature and its utility for the plants in which it is most ordinarily found, we see it in a light which is sufficiently interesting to satisfy us. If this liquid is not useful to the plant which secretes it and of which it seems to be but an excretion, see of what use it is for a host of insects which feed upon it eagerly; the large animals find in it, as we do, a delectable pleasure and a precious remedy. The ancients advised to eat it with the wax, so as to suffer no inconvenience from it. As it is on the upper surface of the leaves, or that which faces the sun, that honey is ordinarily found, their poets, if not their naturalists said that honey came from heaven itself, it was for them a sweet perspiration from the stars; in the language of Pliny, **sudor siderum** (sweet of the stars) was its name.

The Prolific Queen

I told you, my dear girl, that the laying of the queen is of about 100,000 eggs for the first year; it is according to Reaumur that I dare assert it, but even if this number should be exaggerated, do you think that one-half or three-fourths of this task would be great enough and that it would perhaps be too great if the care of giving life to so many had to be divided with other occupations? She has received the title of mother; did she also deserve that of queen" If the most constant observation can grant the right of an opinion and of expressing it, upon such a subject, I will take the liberty of telling you what I have always thought upon this, since I have been occupying myself with bees. I believe, then, after the great Reaumur, the best of guides in such a delicate subject, that the first rank among the bees belongs without doubt to their queen; among many proofs that I might give you, I will select only the fact which I narrated to you the other day, when you were at Lavigny; you may be sure that it is the queen that decides upon the departure of the swarms.

When everything is still quiet around them, when the workers are still busy with their employment as maids or nurses or occupying themselves with the care of the crop, if we follow the queen with our eyes in a glass hive and the weather is nice, we will see her all at once fretting, changing place, leave the circle which composes guard, pass over the bodies of her faithful wardens, change her slow and stately gait to a more speedy run than appears suitable in one of her size and maternal dignity. In spite of the terror which she shows concerning her young rivals and the apparent aberration which appears to possess her, another idea seizes her; to that of her royalty is joined that of the mother and it is several thousand children that she must look after. Divine kindness, you overlook nothing, nothing is too small in your eyes; our dear Master should have seen this last trait in the natural history of swarms. It has only been seen by myself, and not through my own eyes; I hope my dear girl will not be the last one to have that pleasure.

In another occasion still, the queen holds the reins of government; this, however, is but conjecture, I have not seen the queen touch or strike her subjects with her antennæ, as if she meant to tell them to take from the cells of their hive all the honey which they will need in their new home.

Experiment: To change into truth this supposition, I enclosed, in a glass sand-box, a young queen with a vigorous drone and a few workers to give her the necessary care. The slaughter of the drones had begun in a few hives. The queen paid no attention to the workers, and at first took no notice of the drone either, but all at once, perceiving him but too well, she pounced upon him and stabbed him with her sting; the stroke was mortal.

Other tests had the same result; the workers remained absolutely neutral; they took no part in a murder which had not been ordered.

(Note: The experience of later days does not indicate any action of the queen in destroying the drones. It is believed that the workers alone decide upon their destruction after the crop. The above-mentioned stinging of a drone by a queen has not been verified to our knowledge.—Translator.)

The intervention of the queen was then of prime necessity, for, as you know it already, it is the workers who are usually entrusted with the execution. If I accuse the queen of having given the order, it is because I saw her do the act **under my own eyes**, and, moreover, because I have witnessed the cares of every moment of which they are the object, from their birth till the end of their life, and I cannot believe such a change of conduct towards them without justification or motive, except the obligation of obeying a law whose rigor cannot prevent us from admiring its wisdom; at this epoch of their existence, the drones are only useless mouths, their number is such that famine would soon be the scourge that would desolate the hive, in which they would feed at the expense of their nurses and without supplying anything of their own.

I agree that there may be some doubt in this regard; here is a fact which I have better ascertained: the queen and her female subjects absolutely share the Empire. If the desire of destroying her young rivals in the cradle is most manifest in the queen-mother, the desire of opposing it is not less so among her workers; they are the ones who rule, in this occasion, and the queen, though queen she be, takes flight. This first and unique contradiction is what determines her departure; the equilibrium will soon be re-established between the opposing powers. When the running of the queen has excited the bees and her most expressive language has recalled them to obedience and especially to the injunction of looking after the future, they pounce upon the honey cells, gorge themselves and have only to follow the queen-mother to the spot where she sees fit to settle with them. What name will you give, dear girl, to the society of bees, for which one is needed? If, after my last observation, the name of Mixed Monarchy appears proper, I will not hesitate to adopt it with you, and with common sense.

Honey Advertising Over the Radio

The first report which we have of advertising honey over the radio reaches us from St. Louis. Dr. F. C. Ameiss gave an instructive lecture recently over the radio on the value of honey as food. This was given under the auspices of the St. Louis Medical Society and was sent out by the St. Louis Post Dispatch.

A German Bee Garden

"Der Erlanger Bienengarten" is the title of a 24-page pamphlet written by Dr. Enoch Zander, describing the bee garden at Erlangen, laid out especially for the planting of all honey-producing flora and including bees in many types of hives, besides a queen-rearing station.

The station originated as the bee garden in the forest of the emperor has existed since the middle ages. From this time it has developed, until today it is probably the most complete garden devoted exclusively to honey flora in Europe, if not in the world.

Another Apis Club

The students at Cornell University, who are interested in beekeeping, have formed the "Cornell Apis Club." The purpose of the club is to study the science and practice of apiculture. The meetings of the club are weekly, at which time the different members give short talks on subjects that are of interest. At the present we have only about a dozen members, but we have great hopes of increasing the membership materially before the beekeepers meet here next month.

Donald T. Ries, Chairman.

WATER FOR BEES

By C. P. Dadant.

The present number contains two articles upon the use of water by bees, and their storing of it in the cells. Already, on page 272 of the June, 1922, number, Mr. A. V. Small, of Kansas, described the storage of water in the combs.

We acknowledge that we have never seen water stored in the hive, though we could not assert that it was not stored. But we believe bees need water for only two purposes: to make pap for the brood, and to liquefy sugar, candy or granulated honey.

That bees often rear brood in the cellar, in winter, is a fact, though some experimenters have given us to understand that it is not conducive to safe wintering. However, one of the leading Canada beekeepers of 25 years ago told us, at Toronto, that the reason why their bees came out of the winter so well was that they bred in the cellar during the last five or six weeks of confinement.

Water has been credited variously with influence on different necessities of the bees. Bevan, page 50, wrote that "without water no wax can be formed."

We have already quoted Mr. Langstroth, who quoted Berlepsch, when he wrote: "The Creator has given the bee the instinct to store up honey and pollen, which are not always to be procured, but not water, which is always accessible in her native regions." Mr. Langstroth thought bees needed water, "to digest pollen and prepare the food for the young, and to dissolve honey which sometimes granulates in the cells.

Della Rocca, a very accurate observer, of 1790, was of the opinion that water is needed only for preparing the food of the embryos (the brood). "So we see that the greater the number of their broods, the more active they are in gathering water." He adds that, "at times, the bees bring in so much water that the inner walls are dripping water which gathers in drops at the bottom."—(Traite Sur Les Abeilles).

This last experience was perhaps due to the climate of the Island of Smyrna, in the Mediterranean, where Della Rocca lived. The climate may have been so moist as to cause this extraordinary condition. Similarly the experiences of beekeepers living, as does our Kansas friend, Mr. Small, in a very dry region, may be due to the climate they inhabit.

Cheshire (1888, Vol. 2) writes: "While honey is coming in, it provides the requisite water for forming the diet of the larvæ; and hence, bees then are quite independent of our assistance in this direction. But in early spring, when breeding is progressing, and the hive contains no honey but old stores, the poor inmates often suffer the direst distress for lack of water. They may at such times be found flying in search of it, even when the temperature is so low as to make the death of not a few certain. One of the signs of water-dearth is the collection of particles of candied honey on the floor board. The nurses uncap the cells in succession, and extract from each the liquid portions, dropping, from time to time, the solidified particles upon the floor beneath." We have all seen this.

Cowan, in his oft republished "The Honey Bee" writes: "Water is also used (for the brood), but is not stored, and the bees only collect it as required."

Dr. Miller, in his "Thousand Answers" to the question: "What do the bees do with the water they get in the mud-holes?" Replied: "The same as they do with water from any other source; use it for drink and to thin honey for feeding the brood."

Dr. Phillips, in his "Beekeeping," writes: "Water is needed at practically all times during the breeding season, perhaps more especially in hot weather. The bringing of water to the hive is most noticeable in the early spring."

The "A B C & X Y Z" says that "the amount of water required depends largely on how much brood-rearing is going on, and whether nectar is coming to a considerable extent from the fields." It also mentions water as being greatly needed in barrel quantities "in bringing bees in carloads from south to north or from north to south."

On the other hand, Harbison, who first shipped bees in large quantities across from the east to California, via Panama, before the building of the canal was even thought of, wrote (Beekeeper's Directory, 1861): "No water should be placed within the hive at any time, unless the bees are confined and forced to breed during warm weather. It is soon enough in the season for them to have water when they can go forth and obtain it themselves. I am aware that Mr. Langstroth and others have attempted to show that water is indispensable to the health of the bees during the winter, as well as in the spring and summer. In this I differ with them and will give my reasons: First: honey and pollen constitute perfect food for the bees, they will even live for months on honey alone, though both seem required when rearing brood. Although commencing to breed in January, only a limited amount of brood is found till they commence flying out in the spring. . . . . It is also well known that in a hive having proper ventilation, which will prevent the condensation of moisture, the bees remain dry and enjoy superior health, and are found to multiply more rapidly than if not well ventilated. And further, bees carry but a limited amount of water when they first gain their liberty in the spring, and the demand for it gradually increases till the period of swarming, after which time the quantity rapidly diminishes, so that after the first of September but few bees are found to visit watering places. The different management of bees by different parties who shipped them from New York to California, is proof in point; those who did not water or feed during the voyage succeeded much better than those who did so regularly; this was the result as tried side by side on board the same ship."

Charles Dadant, who made many failures at first in importing bees from Italy, wrote in the "Hive and Honey Bee," upon the question of "Shipping Queens":

"When they are to be confined a long time, the question of food is the most important. Many were the blunders made by the first shippers, who imagined that they required a large amount of food and literally drowned them in honey. By repeated and costly experiments, we ascertained that the bees that arrived in the best condition were those that were fed on the purest saccharine matter. Those that suffered the most were those that had the most watery, or the darkest honey. Water, which some Italian shippers persisted in giving them, in spite of what we could say, was noxious; as the consumption of it, with food, helped to load their abdomens with matter that could not be discharged, causing what is improperly called dysentery. Water is needed only in brood rearing."

Water is needed in other circumstances, to liquefy granulated honey or to dissolve sugar or candy. Here is an instance mentioned by Professor Gaston Bonnier, of the Sorbonne, at Paris:

The railroad line from Paris to Lyon passes by my Vegetable Laboratory of Biology, and the Georges De Layens apiary is very close to the railroad tracks. A few nights ago a freight train suffered a collision and a car loaded with crystallized sugar in coarse grains, being broken in two, all the sugar was scattered on the ballast.

"The following morning the field workers were not slow in discovering it, and its presence was signalled to the divers colonies. Swarms of bees hastened to the open barrels used for sprinkling and to the little basins in which aquatic plants are grown; from thence to the sugar that was spread upon the railroad track.

"From that time on there was general traffic from the hives to the water, from the water to the sugar, and from the sugar back to the hives. What a godsend- especially this year, after the failure of the locust bloom and the shortage of nectar in the sweet clover and other wild honey plants. But it was some work to convert this mass of sugar into syrup and to store it in the hives. However, at the end of four days there was not a trace of sugar left, the entire carload had been stored away.

"We must say that the workers displayed extraordinary activity and got up earlier and went to bed later than usual.

"We must say, also, that quite a portion of the sugar was taken away by bipeds, but the latter often desisted in the fear of stings from their competitors, the bees; for many did not know that in such an occurrence the bees do not sting.

"Finally, the latter secured the greater part of the booty, and this unexpected harvest will enable them to keep up their colonies till the blooming of the heather, which is just commencing in the Forest of Fontainebleau."

It is sometimes remarked that "there is nothing new under the sun." But if the bees store water, in **the cells,** this fact is new to most bee writers, for we are unable to find a single one making that assertion in a book on bees.

On the contrary, Dzierzon wrote ("Rational Beekeeping," English translation, page 32): "Water is not stored up in the hive, but the bees fetch it when needed. But bees not only require water to prepare the food for the brood, they also frequently require it when honey has become too thick, or has solidified entirely, to dissolve or dilute it, and to render it fit for their own use; and if they are unable to get it, the colony may perish from what has been called water-dearth (durstnoth). How much bees sometimes suffer from thirst may be seen from the eagerness with which they suck up every drop of the water which is squirted into the entrance of the hive to keep them back from flying out at too early a period, and even lick the snow thrown into the entrance for the same purpose." On this statement, the reviser, Mr. C. N. Abbott, writes: "We have come to the conclusion that bees cannot resist the temptation to take up water whenever it appears within their hive, and hence, in damp hives, in cold weather ,they often get so overcharged with it as to become dysenteric."

The American Bee Journal is published, not only to teach that which is already known, but to learn more, therefore we are open to all reasonable statements and arguments, on this and all other bee subjects.

WATER IN WINTER

By F. B. Paddock, Ames, Iowa

The importance of water in the life economy of the honeybee has been mentioned frequently in literature from very early times. Very few beekeepers fully appreciate what water means to the bee, and they have little or no conception of the quantity used. It is interesting to note in Dadant, "Berlepsch was right when he advised beekeepers to give water to bees during winter. . . ." The need of water is usually associated with brood rearing, but never with the winter requirements of a colony. During the last flight days preceding actual wintering the bees seem to gather water feverishly. On December 4, 1922, when the temperature was 47 degrees, the bees from 16 colonies waiting to be put in the cellar were gathering water in the greatest haste possible. Perhaps it may be true that far too many colonies suffer from too much moisture during the winter, but this has been shown to be the direct result of wholly unfavorable conditions for wintering. Phillips says, "Bees need water in winter, but they get enough in their food, provided the temperature does not get so high that the relative humidity of the outer air is too low." It is assumed, therefore, that water can be available at most any time it may be needed. Nothing has been said of any attempt by the bees to store water either in cells or by certain workers serving as containers for the colony.

During the cellar period of the winter 1921-22, observations were made with one colony in regard to its attitude toward available water. This colony produced a good average crop during the seeason of 1921, but the old queen was replaced on August 3. During the fall the colony built up so it was classed as excellent by the end of the honey flow. The stores were considered as doubtful, so five pounds of honey were fed rather late. On November 23 the colony was placed in the cellar.

The first water was given this colony on January 10, 1922. Two and one-half ounces were placed in a pail lid which was pushed into the entrance of the hive. The cluster of bees seemed to be very close to the water and three workers went to the water at once. An inspection one hour later revealed that all water had been taken up and many active bees were in and around the lid searching for more water. It is not possible to say how long the bees were engaged in taking up the two anl one-half ounces of water. The temperature of the cellar during this period was 47 degrees F., which was higher than desired for minimum activity. The humidity of the cellar ranged from 56 to 60 degrees. During this period of cellar confinement scale colonies lost six pounds.

Water was not given to this colony again until February 13. At this time six ounces was given in a pail lid placed in the entrance, as on the previous occasion. The cluster now was closer to the entrance than formerly. As in the other instances, some of the bees left the cluster immediately to take up the water, in fact, the lid was surrounded with bees as closely as possible within five minutes. The water was all taken up in one hour this time and the usual difficulty to give up the search for more was apparent. The temperature during this period was 45 degrees F., and the humidity was 60 per cent. Since the last water was given the scale colonies had had lost 3 pounds, or a total of 9 pounds since the colonies were put in the cellar.

This colony was taken from the cellar on March 10, 1922. During the entire cellar period the scale colonies had lost 12½ pounds. No examination could be made to ascertain if the stores in this hive were in any way different from others, but in the yard of 40 colonies it is reasonable to assume that this colony was average. Its weights into the cellar and out were certainly average. It was not possible to ascertain if brood rearing had been incited by giving water in the cellar. During the season of 1922 this colony gave good average results and at the end of the honey flow was rated as excellent.

From this experience one cannot help but wonder why the bees took this water so quickly if they do not need water during the winter and if ample was available by the process of condensation within the hive. It is hardly reasonable to suppose that the water would be taken if it was not needed. This colony was given a total of 14½ ounces of water over a period of approximately five weeks. How much more would have been taken is only a matter of conjucture. Certainly no detrimental effects were observed, as is generally supposed.

This work will be continued through the coming winter.

THROUGH AUSTRALIAN EYES

By Tarlton Rayment, author of Money in Bees," "Profitable Honey Plants," Etc.

Water in Cells

Do you know, Mr. Editor, we were very much surprised on re-reading the June number of the Journal, to find that with all your years of experience you were unaware that bees stored water in combs. Coming from such an authority, we are amazed, because it is such a common occurrence in Australia. Times out of number, we have removed our flat hive-covers and found the tops of the frames quite wet with water that had fallen out of the cells in burr-combs built on the under part of the cover. We have tasted this liquid dozens of times, and it has no trace of sweetness. But we can go further and state definitely that we have often seen embryo queen-cells containing water, and we can remember shaking a comb and seeing quite a shower of water fall from the cells.

Now we are not in error, nor have we mistaken the water for newly-gathered nectar. We have observed this phenomenon during a droughty spell when nectar was practically non-existent, and we feel inclined to believe that we observed most water during such spells of dry weather. Owing to unpropitious seasons, we have often had the colonies under close observation, hoping to discover the first cells of nectar from an impending flow. A shake of the combs threw out considerable liquid, but no sweetness was apparent to the taste; neither did the evaporated liquid acquire any "stickiness," as is the case with nectar, however thin.

But having a high opinion of your judicial reasoning, we will relate a curious case for your evening meditations. A friend of ours, a rather successful apiarist, but a man of sound personal integrity, related that he placed 150 strong colonies of bees out in the middle of a large plain-

like tract of land that carried no water for ten or twelve miles. The colonies had no shade of any kind, and the temperatures were high—over 100 degrees F.

Our friend carried out each day on his wagon 16 gallons of water, and the colonies drank up every drop. He did not increase the quantity because the haul was over loose, sandy ground, so he is unable to say how much more the insects would have consumed. There was a bounteous flow of nectar.

After some months our friend was hard put to find enough water for himself and horses, so the bees had to go without. They could not get one drop of water, but while they were short of 16 gallons per day, they were quite unaffected by the deficiency. You will at once reply that the bees secured sufficient moisture from the new nectar. Of course, but when the flow ended the bees were left without water, but he assures me that he could see no difference. Cattle could not pasture on this land because of the scarcity of drink; neither could horses, but sheep thrived on the country for months, and, like the bees, could get no water. Had water been available then, the cattle would have found it.

Nectar Secretion

Your correspondent, Axel Holst, of St. Thomas, Virgin Islands, states that "real weather for earthquakes," is ideal for nectar secretion, and during such times he has heard the nectar dripping from the trees. Now "real weather for earthquakes" he describes as "calm and somewhat cloudy, hot, 'depressing' days without rain." That is just it, we cannot describe it better, for while we have no earthquakes to tumble things about, we do have a considerable number of days just as described. In our honey-plant book we have recorded a month's observation of one of the indigenous plants (Hakea), and we found that that species is a fairly constant yielder, but on one day of the month, when conditions seemed identical with days of heavy secretion, there was not a sign of nectar. We recorded the temperature, time, direction of wind, cloud conditions, hours of greatest yield; but neglected to take barometric readings. Holst seems to think that barometric pressure influences the sap pressure inside the plant, We have observed fields of "cape-weed" **(Cryptostemma calendulaceum) "drowned"** by a terrific downpour of rain, and though the succeeding days were all that could be desired for nectar secretion, there was a total dearth. But in this case we realize that the whole of the plant's energies were needed to get rid of the surplus water to enable it to survive, and the inability to secrete nectar it not surprising.

Your Journal printed a letter from E. P. Skyles, of Texas, who suggests that a tabulation of American honey plants should be compiled. Well, if the confusion that exists regarding Australian plants is any criterion of the conditions existing in the United States, then we extend our sincerest sympathy to the brave compiler, whoever he may be.

Limiting the Queens

Says Dundas Todd: "If you milk a cow to the limit at the start you will get a full limit cow in milk production. So with a young queen, unless you force her to her limit the first period of laying, she will never be any better that that first round." No, Mr. Todd, our many years of experience are against you. Autumn-reared queens are good enough. What about it?

LOSS OF VIRGIN

By E. M. Cole

In the Journal of January, 1923, page 45, you have a note on "Colony Restlessness from Loss of Virgin."

I have often noticed this and profited by it. It is similar to the restlessness shown by a colony losing a fertile queen, and may be seen evenings and early mornings for two or three days after loss of the virgin.

I don't know how universal it is nor if small nuclei show it, but here is some testimony that may surprise you, Langstroth reprint, page 253:

"Every colony which has a new queen should be watched in order that the apiarian may be seasonably apprised of her loss. The restless conduct of the bees on the evening of the day that she fails to return will at once inform the experienced beemaster of the accident which has befallen his hive."

The beekeeper, especially the small beekeeper, may save himself some loss by watching for this sign of queenlessness for two or three days after any manipulation he has made; if bees are running around the entrance and over the front of the hive he may be sure he has killed the queen.

If you have not been working with the bees and find a colony showing these signs you may be sure a young queen has been out to mate and failed to return.

I had a curious instance of this two years ago. Early one morning I noticed the bees running over the front of a hive and felt sure they were queenless. The colony had not been handled for at least 18 days, so I was sure a virgin had been out to mate and had not returned.

Often at a time when bees are inclined to rob, if you blow a little smoke at the entrance, on taking off the hive cover you will find the queen on the top bars in a little ball of bees.

When this hive was opened there was just such a ball of bees on the excluder and I felt sure this ball contained a queen and this puzzled me.

The entrance indications showed a queenless colony, and if not queenless, I had not smoked the entrance and driven one up, for I never blow smoke at the entrance any more; I quit that long ago.

I scattered the ball of bees and found a queen, and this is what had happened: The last time the colony was handled, when I closed the hive the queen was on a top bar; when the excluder was put on (an unbound zinc) she was caught between it and the top bar and some pieces of burr comb and had been held a prisoner for 18 days or more.

Evidently they had cared for her, but as she was not attending to business, they had proceeded to supersede her, and the young queen had failed to return from her wedding flight.

So it seems that a colony may show signs of queenlessness with the old queen in the hive, if the virgin goes out to mate and is lost.

Iowa.

BEEKEEPERS BY THE WAY

Mrs. McCabe.

A Successful Lady Beekeeper

Mrs. M. McCabe, of Minneapolis, is a successful beekeeper of 22 years' experience. Her first season provided honey for the table and increased her bees from one colony to three, The enthusiasm which developed that summer has never subsided and she now has a fully equipped apiary on the lot back of her home in the city. A photo of the apiary was shown in connection with Prof. Jager's article in the February issue. Mrs. McCabe has won sweepstakes at the State Fair with the product of her bees. When the family grew up and married and she found the old home too large for herself and husband, the bees built a pretty little bungalow on the adjoining lot, where they now reside.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

QUEENLESS COLONY—BEES FLYING IN COLD WEATHER

1. Please tell me if it is safe to introduce a queen in spring to a colony that has lost its queen in last part of December. Or do you recommend to dispose of that colony for having been too long queenless?

2. One of my colonies of bees is acting strangely, the bees coming out and flying while weather is 30 above zero, and freezing to death. What do you think causes this? ILLINOIS.

Answers.—1. As a rule, a colony that has gone through the winter without a queen is hardly worth saving. But if you desire to increase the number of your colonies and this one appears still strong in May, without any drone-laying worker, you may succeed in introducing a queen to it. Personally, I would unite it with some other colony. If you decide to keep it, give them a little brood just before introducing the queen and make sure that all the queen cells they may build on it are destroyed.

2. Something may disturb that colony, or it may have bad honey; but if the bees that die from flying in too cold weather do not appear swollen with feces or do not show signs of dysentery, the colony is probably all right, unless a large number of bees get lost in this way.

SMOKE METHOD OF INTRODUCTION

1. Please tell me what the Miller smoke method of queen introduction is. I see a piece in the Journal speaking of it.

2. I would also like your knowledge on the best way of introduction. ILLINOIS.

Answers.—1. The Miller queen introduction by smoke is as follows:

"A colony to receive a queen has the entrance reduced to about a square inch with whatever is convenient, as grass, weeds, rags or wood, and then about three puffs of thick white smoke—because such smoke is safe—is blown in and the entrance closed. There is a seven-eighths inch space below the frames, so that smoke which is blown in at the entrance readily spreads and penetrates to all parts of the hive. In from 15 to 20 seconds the colony will be roaring. The small space at the entrance is now opened; the queen is run in, followed by a gentle puff of smoke, and the entrance again closed and left closed for about 10 minutes, when it is reopened, and the bees allowed to ventilate and quiet down. The full entrance is not given for an hour or more, or even until the next day."

This method, with slight variations, was formerly given by Alley, and is also found in Doolittle's "Scientific Queen Rearing," but is far from safe at all times.

2. The method which we recommend is to put the new queen in an introducing cage, and after having removed the old one, hang the cage between two combs of brood, in the center of the hive. The queen is released two days later by placing a piece of comb honey or honey cappings in place of the stopper of the cage. But there are dozens of methods of introduction, several of which are to be found in "Practical Queen Rearing."

HOW MANY TRIPS?

1. Providing a single bee could store a pound section of honey, how many trips would it have to make, and how many miles travel?

2. How many pounds of nectar, as taken from the flowers, would make a pound of sealed honey? OHIO.

Answers.—1. The tests of Prof. Koons, given in the A-B-C, give approximately 1-20,000 of a pound as the average load of a bee. Bernard de Celieu asserted that bees carried about 1-16,000 of a pound of nectar. The amounts can only be approximated, because bees do not always carry a full load. Robbers, carrying honey from another hive, will load themselves to the utmost, while in many cases bees coming home from the field have but a very small part of a load.

2. This, also, is irregular. It has been asserted that some nectar contains 85 per cent of water, while the nectar harvested from heather, in some countries, is so thick that it cannot be extracted.

PACKAGE BEES

1. In buying bees by the pound, if I bought a 3-pound package would the bees store much surplus honey this summer?

2. If I got them in May would they swarm this year?

3. Does the climate have anything to do with bees, and would it be all right to order bees from North Carolina? ILLINOIS.

Answers.—1. If you buy a 3-pound package early, so that they will have time to breed before the crop opens, you may harvest as much honey from it as from a fairly average colony, provided you supply them with empty combs or comb foundation and plenty of food. But we cannot tell you whether there will be much honey harvested in your section.

2. Neither can we tell you whether they will swarm. You should bear in mind that it takes about 35 days from the time the egg is laid in the cell until the worker bee becomes a really active field worker. Of course the queen must lay quite a while before she will have a swarm to cast, if swarms come at all.

3. Surely the climate has a great deal to do with how early bees will breed, especially if they have food in plenty. Of course they always breed more freely when there is both honey and pollen in the fields. Shipping bees from the South in spring is generally profitable, because they are ready for the crop sooner than the bees from the North.

TAINTED HONEY

I have some honey that was put into a can which had been used for gasoline and has a strong gasoline flavor. Is there any way of treating it to kill the taste of the gasoline so the honey can be used for table or cooking? CALIFORNIA.

Answer.—I doubt very much that it be possible to evaporate the odor of gasoline. You know how long it stays when clothing is cleaned with gasoline. Perhaps you could help it to disappeear by heating the honey and pouring it from one vessel to another while hot.

I remember that a customer complained of some of our honey having the odor of coal oil; an investigation revealed the fact that they had just moved from one house to another and had hauled the coal oil can and the pail of honey side by side. That was enough to taint thehoney.

Prhaps you had better keep that honey to feed to bees at breeding time.

BEST METHOD OF INCREASE

1. Will you please advise me which is the best method to increase my stock of bees, by buying the hybrid bees in hives, or buying package bees with queens?

2. Which is best, to buy 2-lb. or 3-lb. packages of bes?

3. When should I have the package bees arrive? IOWA.

Answers.—1. If you can buy black or hybrid colonies of bees cheaply, in your vicinity, you can make sure that they are in good shape and have no disease, that is the best way to increase your stock. Later in the season you can buy Italian queens and Italianize them. If they are in box hives or in movable frames with crooked combs, you will probably buy them cheap enough to make it an inducement to transfer them into good hives at the time of fruit bloom. Otherwise, buy them in packages from the South.

2. I prefer the 3-pound packages. But people have succeeded very well with 2-pound and even 1-pound. That depends upon whether the season is favorable.

3. Have the packages arrive at your place in May. If they arrive too early they will have to be fed, but if they are well cared for and are given full sheets of foundation, they will breed and be very strong for the clover crop. On the other hand, if they do not arrive till the opening of the crop, you will not make so much profit out of them, but you will have less trouble in caring for them.

GRANULATED HONEY

1. I have read of using a solar wax extractor to prevent honey from granulating and would like to ask a few questions concerning the practice.

2. Would hothouse sashes leaning against the south side of a building and having the ends closed do as well?

3. How long is it necessary to leave the bottles in the sun in the summer time? In fall or winter?

4. If the honey is exposed to the action of the sun an undue length of time, will it lose a part of its flavor, as in treating by artificial heat?

5. Is it possible, by this method, to prevent honey from granulating for several weeks after the package is opened? NEBRASKA.

Auswers.—1. There is very little honey heated by solar rays. In the olden days (and perhaps yet today in some backward countries of Europe), the honey was rendered by solar heat. By placing the combs on a rack, in what the French called a "mellificateur solaire," the combs were melted, the honey flowing to the bottom of a pan, with the melted wax at the top. The complaint was that the honey acquired more or less of a "waxy" flavor, due to some of the essential oils contained in the wax. But this did not prevent the honey from granulating. In fact, the method would probably have been rejected if it had prevented the honey from granulating, for one cannot find in those European works any method for preventing granulation, but, on the contrary, methods for inducing granulation, the most common of which was the beating or stirring of the honey in cold weather. This granulation by forced means gave the honey a very light color, because more or less air was mixed into the honey. Honey is not considered as high grade, in Europe, which does

not granulate in cold weather.

As the sunshine of our summer is much more intense than that of Europe, it is quite possible that honey heated in the sun may be prevented from granulating, but we do not know this positively, having never tried it.

2. Hothouse sash, in summer, over pans containing honey, would certainly heat quite sufficiently to evaporate some of the moisture and, as honey which is very ripe rarely granulates, it is possible that the granulation would be thus practically prevented. I do not know for sure.

3. This, also, is an unanswered question, but I believe one summer day's action would evaporate the honey quite perceptibly. The sunshine of fall or winter would not have much effect, except in melting it when already granulated, even in bottles.

4. Yes, I believe that long exposure to the sun would entirely evaporate the essential oils which give honey its perfume, both in flavor and in odor.

5. Honey would probably not granulate again for a while after it was heated in this way.

STORING HONEY

1. How is the best way for handling honey by the ton, when one supplies orders in various size packages? That is, how should one store it and how should one liquefy it?
2. How much should honey be heated and how keep it from granulating?
3. How long can it be kept from granulating? OHIO.

Answers.—1. If you produce the honey yourself, better keep it in a tank, if you want to put it up in different sizes. We put up our honey in barrels, because we haul it in from apiaries in different directions. When it granulates in the barrel, it is not difficult to remove, after one has had the practice, by carefully taking the head out of the barrel and replacing it afterwards. The barrel will be as good as before. If you buy honey, you will generally get it in 5-gallon tins. These may be heated over water to liquefy the honey, if granulated.

2. Honey should not be heated above 160 degrees, if we do not wish to destroy the essential oils which give it its good flavor. This is done by heating over water. Large establishments have special melting apparatus that the average beekeeper does not need. When honey has been heated to 160 degrees and kept warm for some time, it generally prevents it from granulating again.

3. That depends upon the degree of cold to which you expose it. But we insist that beekeepers should teach their customers that honey which is granulated is good and may be liquefied by the customer at any time. Many people who know what granulation means prefer it in that shape.

GOLDENS—DISTANCE BEES FLY

1. Why is it that the Golden Italians are being condemned as being inferior to the 3-banded strain? Are they not the same bee? Only that the Golden bees are bred from those that show the most golden color and the 3-banded bees from those showing the three bands? If in choosing our breeding queens we select and breed from those that are the most prolific, the best of honey gatherers and the most resistant to disease, then why should one be superior to the other? I think that we will find just as poor a bee among the 3-banded stock as we will among the goldens. I wish that you would give me your opinion of the Goldens.
2. Will a bee, that has to go 2 miles for nectar, work with the same will as one that has only to fly one-half a mile?, as some beekeepers have said that they moved some of their bees within half a mile of nectar and that they didn't store any more pasture. INDIANA.

Answers.—1. As it is almost impossible to have all the qualities united in a man or a woman, it is as impossible to get them all in a bee. So some people select for honey-gathering qualities first, others select for color first. The result is that some get yellower bees while others get more crop. But if you have bees in which all the qualities are united, go ahead and breed from them. To me, color is of no importance, provided the bees are of pure race, and if my bees show the yellow rings and are peaceable and hang well to the combs, I am satisfied, provided they be also good honey gatherers. But no matter what I may say, people will look for color first, and if it suits them, it is all right. Many people look for beauty first when they select a wife, and sometimes a beautiful wife may have all the other qualities. In that case she is a paragon.

2. I don't know whether a bee that goes 2 miles for nectar works any harder or travels any faster than the one that has to go only a half mile. I would take chances with the latter, no matter what other people might say. If the weather is stormy, there will be less loss of bees in the shorter distance.

TRANSFERRING

I have a colony of black bees in an old 8-frame hive. The colony is old but very strong. When the bees were hived, the hive had frames, but no starters, so the combs are built in every imaginable shape. Being an old colony, the inside of the hive is almost a solid mass of comb and propolis. If I can transfer these bees into another hive, I can fix up the old hive in good order. Is there some sure way of transferring? I have tried smoke, but I never could succeed in driving all the bees from an old gum, and in removing the old combs I always kill and drown so many. One time I drowned the queen. Do you think I could force the bees to leave the gum by using carbolic acid in the smoker? Or, by placing an empty hive on top, could I force them to leave by placing rags, soaked in a weak solution of carbolic acid, on the bottom board? MISSOURI.

Answer.—The trouble with you appears to be the difficulty of driving the bees out of the hive. You probably did not try it on a warm day. For such a job as this you must select the warm part of a spring day, when the fruit trees are in bloom. Uncover the combs of this hive, remove it to a spot away from its stand, placing any sort of box temporarily on the old stand. Then use a hive of the same size as the one in which the bees are, without frames. Place it on top of the other. Cover well, and smoke and pound the lower hive until the bees climb up into the other box. If you do this right you should remove both the queen and the greater part of the swarm. After removing the bees and putting them on the old stand, you should cut the combs loose from the walls of the hive with a big corn knife or other blade, so that you can remove the outer hive by just inverting the whole thing and lifting it off. This should be done in the house or in some sort of a room where robbers cannot trouble you. Then you may cut out the combs and fasten them in new frames, or in those same frames, if they are sound. We fasten them with wires, nailed into the top and bottom bars of the frames, which stay there until the combs have been patched up by the bees.

Using drugs is a poor way. We don't need it.

SWARM PREVENTION

I am a busy farmer and haven't much time to spend on swarming. I began the season with 10 stands, finished with 32; had about 35 swarms, losing many. I made a fair crop of section honey, but some of my queens got into my sections in the supers. My hives are 10-frame standard, except 5 Jumbo. I am thinking of using two hive bodies for brood chambers, running for section honey on top of that. I have all of the bees I have time to care for.

What advice would you give me for the coming season to prevent swarming as much as possible? I am located in a sheltered valley and winter on summer stands without packing. All supers that are not well filled I leave on the hives during winter; thought this might be one reason my bees were so strong and active last spring. MISSOURI.

Answer.—Prevention of swarming is only comparative, not total. The main requirement is, of course, plenty of room for the queen to lay and plenty of room for the bees to store honey. But there are other requirements. Spacing frames 1½ inches from center to center helps to give bees more ventilation than the 1⅝ spacing. You may secure this by removing one comb out of your 10-frame hives and spacing the 9 remaining combs evenly.

You need, also, shade over the hives in hot weather, and plenty of entrance room, raising the hive from its bottom, in front from one to 4 inches. The bees should never be so uncomfortable as to lie hanging out, in a good honey season.

Then you want young queens. Old queens cause swarming because the bees prepare to supersede them.

You need a minimum of drones. Too many drones cause extra heat and induce swarming.

Using the 9-frame stories would be quite a help. The leaving of unfilled supers on the hives, of course, increases the amount of food, if they are partly filled, and helps to make strong colonies in spring. But those sections are no longer attractive to buyers, because the bees soil them more or less.

(Why not produce extracted honey? It requires less attention on the part of the beekeeper and there is less swarming.—F. C. P.)

DOUBLE-WALL HIVES—PACKAGE BEES

1. I have 23 home-made hives with movable frames, single-wall; would it be all right to make them double-wall by making another wall about 3 inches larger than the hive and pack in between with leaves or straw? Would you advise me to leave it on all summer, or take the outside off-
2. I was thinking of sending for a 2-pound package of bees and queen and put them in on empty hive with starters, would they be all right? WISCONSIN.

Answers.—1. Yes, it will be all right to make double walls to your hive and leave them on all summer. Some of our best beekeepers, such as Mr. Crane, of Vermont, leave their hives with the packing on all summer. It protects from the heat as well as from the cold. The only requirement is that the bees should have sufficient entrance for summer ventilation.

2. A 2-pound package, put on starters, may have considerable difficulty in building its combs. It would be better, if you do not want to go to the expense of full sheets of foundation, to borrow a few combs from other colonies. But the latter may build drone combs in the place of the borrowed combs. Foundation is much surer, and really cheaper.

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Yard No. 2. This yard of bees was originated from our imported stock, and mated to our domestic drones. They are a beautiful bright three-banded strain of bees, gentle, prolific and great honey gatherers.
Imported strain: Queens, 1 to 4, $2; 5 to 11, $1.50; 12 or more, $1.45.
Yard No. 2: Untested queens, 1 to 4, $1.25; 5 to 11, $1.20; 12 to 24, $1.15.

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One-pound package	$3.00;	$2.90 with queen
Two-pound package	$5.00;	$4.50 with queen

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W. H. MOSES, Lane City, Texas, U. S. A.

CARNIOLANS

are the best winterers, build up rapidly during the spring months, are very gentle, build exceedingly white combs, are most excellent workers on both clover and buckwheat, gather practically no propolis, resist brood diseases as well as any other bees and will swarm no more than Italians, if properly managed.

I have prepared a paper entitled "MERITS OF THE CARNIOLAN BEE," describing the desirable characteristics of this race of bees more fully, the best methods of management for producing comb honey and extracted honey, prices of queens, etc.

It is Free for the Asking

Get acquainted with the merits of this race of bees in making your plans for the coming season.

ALBERT G. HAN
Glen Gardner, New Jersey.

BEES AND QUEENS

Tested Italian queens	$2.00
Hybrid queens	1.00
Queens only with nuclei:	
2-frame nuclei—Italian	3.50
2-frame nuclei—Hybrid	3.00
3-frame nuclei—Italian	5.00
3-frame nuclei—Hybrid	4.00

Add price of queen, if wanted with bees. Shipment begins April 1, 1923. No disease ever known in county. Satisfaction or money returned.

DR. J. D. SHIELDS, Rt. 2 Natchez, Miss.

Beekeepers Fool Vigilantes' Posse

Osceola vigilantes had a wild night recently following the report that three men wearing masks with a heavy box, which was supposed to contain money, at their feet, had been seen near the side of the road by an automobile driver near Murray. After scouring the country thoroughly, and spending most of the night in hunting for the supposed bandits, the vigilantes were disgusted beyond words when they found that the "desperadoes" had been a minister and a doctor, who had gone to the spot to lure a swarm of bees into a hive.—Albia, Ia., Union.

BEE SUPPLIES
THAT ARE MADE TO SATISFY

Send us your orders for your 1923 requirements now.

SPECIAL PRICES ON SECTIONS:

50,000 4¼x4¼x1½ plain No. 2 ---------- $7.00 per 1000
25,000 4¼x4¼x1¾ Beeway No. 2 ---------- $8.50 per 1000

We guarantee the above to be first-class in workmanship and material.

Write for our new 1923 catalog showing full line of bee supplies.

A. H. RUSCH & SON, Reedsville, Wis.

Package Bees and Three-Banded Italian Queens

Read the article, page 19, January issue, American Bee Journal, and be convinced package bees are what you need.

A customer in Canada advises the 30 2-lb packages I sent him averaged 150 lbs. surplus honey per colony. His net profit should have been $500 or more. Good queens cause this heavy average. I rear only that kind.

Prices on Package Bees F. O. B. Via Express:

1-lb. package, including young queen ---------- $3.50
2-lb. package, including young queen ---------- 5.00

Ten or more packages, either size, 25c per package less. Can make shipment via parcel post, postage paid; 10 per cent higher if sent that way. Prices on select (one grade) untested queens, $1.25; 10 or more $1.15 each. Safe arrival of bees and queens, pure mating, and a square deal guaranteed. Am booking orders with 10 per cent cash, balance just before shipping. Shipment will be made on the day you name. No disease.

JASPER KNIGHT, Hayneville, Ala.

PACKAGE BEES FOR 1923
THREE-BAND ITALIANS ONLY. BRED FOR BUSINESS

A 2-pound package of the Yancey Hustlers, with a select untested queen, for $5.00; 25 or more, $4.75 each. Attractive prices on large lots. One-fifth cash books your order. Safe arrival and satisfaction guaranteed on every package and queen shipped. Orders are now coming in for spring delivery. Better send in yours and make sure of shipping date. We do not accept more orders than we can fill promptly.

CANEY VALLEY APIARIES, Bay City, Texas
YANCEY BROS., OWNERS

The Stapleton Apiaries

Are located in Southern Georgia, near the Florida line, and we are in position to make early shipments of bees and queens. Queen rearing yard is in charge of Mr. A. S. Blanks, who has had eight years' experience in Georgia, Florida and Texas. Write for prices.

N. L. STAPLETON
Colquitt, Georgia.

Dixie Beekeeper

The 45th edition of this 32-page paper is now out and a sample copy is ready for you, for the asking. All about beekeeping in Dixie.

FLORIDA BEES AND QUEENS

This hardy and prolific stock of 3-band Italian bees has been reproducing itself for more than thirty years in the sand hills of central Florida. Three-frame nuclei with queen, $6.00. Tested queens, $1.50 each. Untested queens, $1.00.

WILDER'S CYPRESS HIVES

Will give you satisfaction in point of service and prices to suit you.
Write for price list and catalog.

J. J. WILDER
Waycross, Ga.

PORTER

BEE ESCAPE
SAVES
HONEY
TIME
MONEY

For Sale by all dealers
If no dealer, write factory

R. & E. C. PORTER, MFRS.
Lewistown, Ill., U. S. A.

(Please mention Am. Bee Journal when writing)

Mack's Three Band Italians

Represents the highest standard to which queens have thus far advanced. They are guaranteed to please you or money back.

Untested		
1 to 49	50 to 99	100 up
$1.00 each	95c each	90c each

For prices on other grades, and bees by the pound, send for our catalog. A postal will bring it.

HERMAN McCONNELL
Robinson, Illinois.

QUEENS
Three-band Italians

PACKAGE BEES

QUEENS
Silver Gray Carniolans

Western headquarters for PACKAGE BEES and RELIABLE QUEENS. Order now for spring delivery. Shipping season for PACKAGE BEES starts April 1, closes July 1; Queens April 1 to October 1. A small deposit reserves your shipping date.

Young bees, every one from a clean colony, with no honey used in shipping cages, also County Inspector's Certificate of bill of health with each shipment I guarantee. Write for circular and prices, stating quantity desired and date of delivery.

J. E. WING, SAN JOSE, CAL.

155 SCHIELE AVE.

Queens Package Bees for the Season of 1923

Mr. Beekeeper: If you want the best quality that is possible to produce, at the lowest price possible to produce, here is the place to buy your queens and bees. I positively guarantee that NO BETTER BEES CAN BE BOUGHT, NO MATTER WHERE YOU BUY THEM. When you order a tested queen or a selected untested queen from me I don't go out in the yard and cage the first thing I come to, like 50 per cent of the queen breeders do. I send out what I advertise; every queen or package must give satisfaction. Now is the time to place your order for spring delivery. Note my prices; if you can buy better bees for less money I would like to hear from you. One-fourth down with order, balance before shipping date.

PRICES—QUEENS

	1	6	12	100
Untested	$ .95	$ 5.50	$10.00	$70.00
Select untested	1.10	6.50	12.00	80.00
Tested	2.50	12.50	24.00	175.00

POUND PACKAGES WITH SELECTED UNTESTED QUEENS

1-pound packages, 1 to 12, $3 each; 12 to 50, $2.90 each

2-pound packages, 1 to 12, $4.50 each; 12 to 50, $4.40 each. 3-pound packages, 1 to 12, $5.50 each; 12 to 50, $5.40 each.

Shipment will be made on date specified. Prompt service and satisfied customers a specialty.

THE FARMER APIARIES, Ramer, Alabama

SEASON 1923

Western Bee Farms Apiaries

MONTEREY, CAL.

Office No. 485 Sixth St., San Francisco, Cal.

Will be ready to ship March 15th.

PRICES—QUEENS

Three-banded Italians.

1—Mated, untested $1.00
6—Mated, untested 5.50
12 to 25 at 85c; 25 to 100 at 75c.

PACKAGE BEES

In two-pound packages only.

One to ten at $3.25; ten to one hundred at $3.00.
One package, with queen $3.85
Large orders for queens or packages will be given a special quotation.

TERMS:

Ten per cent with order, balance before shipment.

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Engravers, Electrotypers, Commercial Photographers, Photo Retouchers, Designers

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Honey in the Local Newspapers

A set of 25 articles on honey, specially prepared for distribution by the beekeeper to local papers to stimulate the demand for honey. These articles deal with interesting phases of beekeeping which will interest the ordinary reader and help make a buyer of him.

We offer the whole set of 25 articles at a postpaid price of only 50 cents, or in lots of ten or more sets at 35 cents each, postpaid.

A real opportunity to have your local people get interested in honey and its production and use.

Order a set today.

AMERICAN BEE JOURNAL
Hamilton, Ill.

Bees and Queens

Your satisfaction guaranteed. Send us your order.

Queens, untested, $1.25 each, $12 per dozen.

Bees, 1 lb. with untested queen, $3
2 lbs. with untested queen, $5.

All mail charges paid.

E. A. SIMMONS,
Greenville, Ala.

BEES IN PACKAGES

Vigorous Italian stock, queens and bees in packages; thoroughbred stock; activeness and prolificness of queens guaranteed. Standard nuclei with frames that fit Root standard hives; also standard combless packages; all containers new. I consider three-frame nuclei superior to three-pound combless packages. My bees are healthy; never had any kind of disease at any time. Shipments begin about April 15. Safe arrival or replacement. Order early and be in time for the booking. Have been shipping bees for years, to numerous parts of the United States and Canada. All queens I sell are young, also laying.

Two-lb. packages with queens, 1 to 25	$5.00 each
Two-lb. packages with queens, 25 or more	4.50 each
Three-lb. packages with queens, 1 to 25	5.50 each
Three-lb. packages with queens, 25 or more	5.00 each
Three-frame nuclei with queens, 1 to 25	5.50 each
Three-frame nuclei with queens, 25 or more	5.00 each

Terms: Cash with order.

As I ship by express, be sure to state name of express station.

C. M. ELFER, St. Rose, Louisiana

Nuclei Our Specialty—Package Bees

Three-banded Italian Queens

Our BEES and our EXPERIENCE will give you prompt and satisfactory service.

One 2-frame nuclei, no queen, $3.75; 25 or more, $3.50; 50 or more, $3.25; 100 or more, $3.00.

One 3-frame nuclei, no queen, $5.00; 25 or more, $4.75; 50 or more, $4.50; 100 or more, $4.25.

QUEENS: One untested queen, $1.50; 12, $15; 50, $60; 100, $100.

Two and three-pound packages of bees at the same price of two- and three-frame nuclei, respectively. Our early order discounts from above prices will interest you. Write and get them before placing your order.

Cotton Belt Apiaries, Roxton, Texas

If You Haven't Seen it You Should Send a Postal Card for a Free Sample Copy of

YORK'S BEES and HONEY

Edited by George W. York, 906 W. First Ave., Spokane, Wash.

OR, BETTER YET, SEND 60 CENTS

if you are a new subscriber, and get all the balance of 1923. It is a monthly, at $1.00 a year, but this special 60c offer is an introductory price which should be accepted by thousands of beekeepers all over America. It is by many considered the best bee paper issued west of the Mississippi River. It is worth dollars to a real beekeeper.

PACKAGE BEES, QUEENS AND NUCLEI

DOLLAR A POUND

Queens accompanying, $1 additional.
Nuclei, 2-frame ---------- $3.00
Nuclei, 3-frame ---------- $4.00

Either Standard or Jumbo Langstroth

Queens, untested, $1; tested, $1.50. Breeders, $5.00, $10.00, $15.00.

These low prices are made in consideration that orders are booked early, so that we may prepare for them in the winter. Send for circular.

Loveitt Honey Co.

602 N. 9th Ave., Phoenix, Ariz.

FREE—Copy of The Southwest Magazine will be sent on request of special interest to those desiring to know about opportunities open in the great Southwest for the Farmer, Rancher, Homeseeker, Business man, Tourist, Sportsman and Investor. Southwest Magazine, Hicks Bldg., San Antonio, Texas.

ROOT QUALITY

BEE SUPPLIES
FULL STOCKS PROMPT SERVICE
A. I. ROOT CO., of N. O.
2042 Magazine Ave., New Orleans La.

Also headquarters for Elton Warner's three-banded Italian Queens, Nuclei and Combless Packages.

One Elton Warner Quality untested queen, one frame emerging brood with adhering bees, and one pound of young vigorous bees, price $5 f. o. b. New Orleans. Extra bees, $1 per lb.

3-frame nucleus, with Elton Warner Quality untested Queen, price $5.50 f. o. b. New Orleans

Combless packages, $1 for package, plus $1 per pound for bees, and price of queen, if queen is wanted.

Young, vigorous TESTED Elton Warner Quality Queens; wonderful honey-gathering strain for EARLY spring shipment. $1.60 each, postpaid.

Untested Elton Warner Quality Queens, After April 10, $1.15 each, postpaid.

Everything guaranteed, including delivery date. No disease; 20 per cent books order; 10 per cent discount on orders of over $20; 15 per cent discount on orders of $60 or over.

Almacen de exportacion para Mexico y Centro America. Correspondencia en castellano.

BEES — ITALIAN BEES — BEES

Full colonies with Italian queen at $15.00 3 for $30.00.

3-frame nucleus with Italian queen at $6.00.

3-lb. package with Italian queen at $5.50, 5 at $5.00.

No disease. Safe arrival and satisfaction guaranteed. Van's Honey Farms,

Van Wyngarden Bros., Props., Hebron, and

NOTES FROM MOSES QUINBY

By E. M. Cole

In Quinby's "Beekeeping," page 29, edition 1865, is the following: "Mr. Harbison has, I understand, patented the manner of introducing the piece of comb. . . . . It is simply to place the comb with brood in a horizontal position, thus bringing the cell vertical, and save the bees the trouble of making a crooked cell. The young bee thus stands on its head like a queen. . . . . He does not claim that this (standing on its head) makes it a queen, but that from the same number of eggs more queens will be raised, etc."

At the bottom of page 329 he gives a method of cage introduction of queens and continues on the next page: "I have succeeded with equal satisfaction, and much less trouble with the following method, due to Mr. L. A. Aspinwall. It is simply to immerse the queen in a little honey, slightly warmed if necessary, and drop her among the bees . . . and consider myself very much indebted, etc."

On page 331, bottom of page, he gives a neat method of introducing a queen into a box hive in October or November, by making them hopelessly queenless.

On page 324, bottom of page, he mentions a wire cloth cage, provisioned, for introducing queen cells.

On page 331 Mr. Quinby mentions a neighbor who successfully requeened box hive by drumming out a small swarm with the queen and hiving them on the old stand. The parent colony, now queenless, is given a new location, the old bees return to the old location. "Two days afterward the young bees readily accept, etc." Showing that even in that day the influence of young bees in queen introduction was understood.

Iowa.

You Want an Adequate Force of Bees

Advocates of small hives missed the necessity of brood room and food storage room to produce big forces of field bees at the beginning of the honey flow.

After seasons of experiment with hundreds of colonies, Dadant evolved the

Modified Dadant Hive

Only in this hive is there adequate room for brood rearing and food storage in one brood chamber without additions. Because of 49 years of manufacturing experience Lewis was chosen to make this hive available to American beekeepers. It is

A Safe Hive

Write us today: "Without obligation to me, send your free booklet on the Modified Dadant hive." Better yet, send $5 for one Modified Dadant hive, K. D., postpaid within the fourth postal zone from the addresses named below.

Part of several hundred Dadant hives owned by E. L. Hofmann, Janesville, Minnesota.

You can be as successful with these proven principles—11 frames, Quinby depth, 1½ inch spaced frames. "Standard" super equipment, feasible.

G. B. LEWIS COMPANY, Watertown, Wis. or

Albany, N. Y.; Lynchburg, Va.; Memphis, Tenn.; Wichita, Kansas.

Needed by Every Beekeeper Good Queens

In Every Queen and Package

There is a guarantee of satisfaction that you have a right to expect
BUY FOREHAND'S 3-BANDS, YOUNG AND HUSKY

The three vital needs of successful honey production are, GOOD QUEENS, GOOD MANAGEMENT and GOOD LOCATION. You furnish one, Nature one and I furnish the other. But you must be the judge of all. You don't want a location in a desert, neither do you want poor queens. You have the same right to choose and reject queens as you have to choose your location. My guarantee allows you this.

Your dollar's worth or your dollar back. Order now and get your bees and queens when you want them. Ten per cent is all that is required with order.

	1-4	5-11	12-24
Untested	$1.25	$1.20	$1.15
Select untested	1.50	1.45	1.40
Tested	2.50	2.45	2.40
Select tested	4.00	3.95	3.50

	1	25 and up
One pound pure Italian bees with young queen	$3.00	$2.90
Two pounds pure Italian bees with young queen	5.00	4.75
Three pounds pure Italian bees with young queen	6.50	6.25

All bees and queens guaranteed to reach you in good condition in the United States and Canada.

N. FOREHAND, RAMER, ALABAMA

HONEY Beekeepers who have sold their own crop and have a steady trade for Honey should buy Honey to fill this demand. It helps to keep their own customers from going elsewhere and also tends to keep Honey prices stabilized.

In 60-lb. Tins,

White orange ----------14c lb. White sage ---------- 12c lb.

Extra L. A. sage ---------- 10½c lb.

GLASS AND TIN HONEY CONTAINERS

2½-lb. cans ----------crates of 100, $4.50
5-lb. pails (with handles), ----------crates of 100, $7.00
10-lb. pails (with handles) ----------crates of 50, $5.25
60-lb. tins, 2 per case, new, $1.20 case; used, 25c.

White Flint Glass, with Gold Lacquered Wax Lined Caps

8-oz. honey capacity ----------$1.50 per carton of 3 doz.
16-oz. honey capacity ----------$1.20 per carton of 2 doz.
Quart, 3-lb., honey capacity ---------- .90 per carton of 1 doz.

HOFFMAN & HAUCK, Inc., Woodhaven, New York

QUEENS

NORDAN'S THREE-BANDED ITALIAN QUEENS (Three-banded only).
Have won World-wide Fame.
They are guaranteed to be absolutely immune to Bee Paralysis. I am booking orders now for spring delivery.

Prices on Queens and Packages.

Select untested queens, 1 to 50 ----------$1.00 Select tested queens, 1 to 50 ----------$1.50

Packages:

One-pound packages, with select untested queen, 1 to 50 ----------$2.50
Two-pound packages, with select untested Queen, 1 to 50 ----------$4.00

Can make shipments when you want them, either queens or packages. I will appreciate your orders, large or small.

References: Alabama Bank and Trust Co., Montgomery, Ala.

M. S. NORDAN, MATHEWS, ALA.

541 Lbs. from one Nucleus

Get our prices on

Untested Queens
Tested Queens
Package Bees

Our bees made record production last summer. One shipping package produced 541 pounds comb honey in short season, another produced 455 pounds. We offer queen sisters and daughters of these proved producers at reasonable prices.

Send for free copy of our production records and price list.

Chaffee-Crites Bee Farms

Amenia, North Dakota

INDIANOLA APIARY COMPANY

Italian Bees and Queens, bright golden and 3-banded. Orders booked for season of 1923 as follows:

1-lb. pkg bees with unt. queens---$3
2-lb. pkg. bees with unt. queens---$5
3-lb. pkg. bees with unt. queens---$6

Ten per cent discount on orders of $25 or more.

Untested queens ----------$1.00 each
Tested queens ----------$1.50 each

Thirty years' experience, hundreds of satisfied customers. Your orders solicited. Satisfaction guaranteed.

J. W. SHERMAN, Valdosta, Ga.

BARNES' FOOT POWER MACHINERY

Read what J. E. Parent of Chariton, N. Y., says:

"We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."

W. F. & JOHN BARNES CO.,
995 Ruby St., Rockford, Ill.

Death to American Foulbrood

(A special sodium hypochlorite)

Marks an Epoch in the Bee Industry

A simple process of feeding and disinfecting with Be-Helth will destroy American Foulbrood and thus prevent great losses

General Laboratories has made long scientific research for a product to combat American Foulbrood. Be-Helth is the result of that work. Now you can avail yourself of a discovery that will save beekeepers tens of thousands of dollars.

Money Back Guarantee

We guarantee that Be-Helth used according to our directions will destroy American Foulbrood. If you do not find it as represented by us we will refund your money on request.

Write for particulars today and send us a trial order. Price $3 per gallon.

GENERAL LABORATORIES
MADISON, WIS.

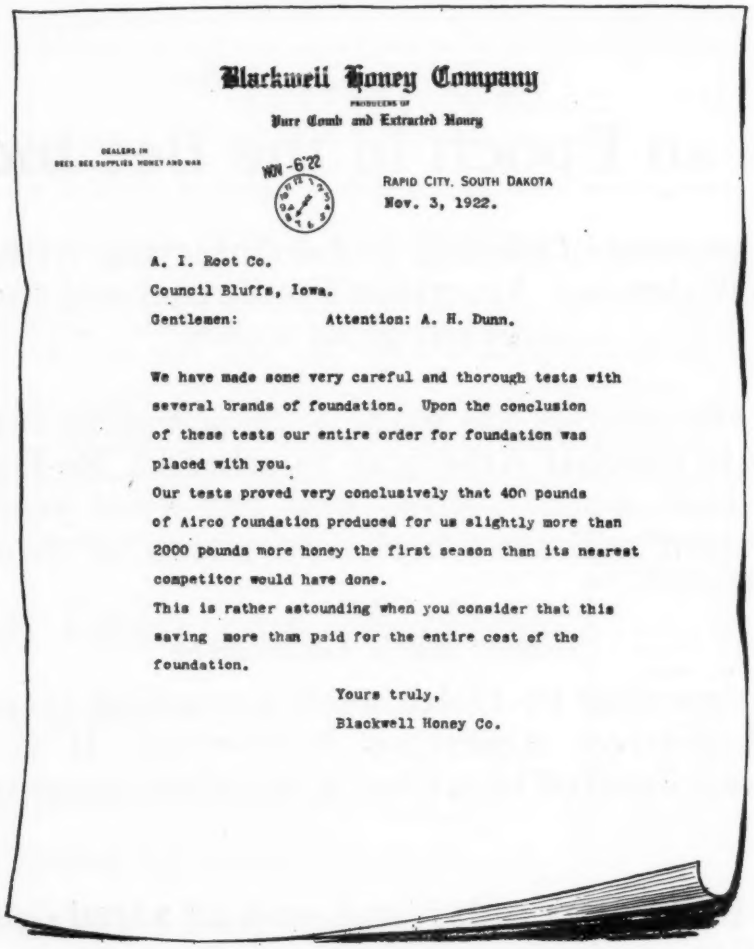
Manufacturers and specialists for ten years in prevention and control of live stock diseases

What About YOUR Yield?

When Beekeepers tell you that your own yields can be increased through the use of Airco Foundation just remember it is a fact.

It is a pleasure to use it, because it stands up so well in frame and sections.

You will use it some time. Why not get *that* increased yield this year?



Blackwell Honey Company

PRODUCERS OF

Pure Comb and Extracted Honey

DEALERS IN BEES BEE SUPPLIES HONEY AND WAX

RAPID CITY, SOUTH DAKOTA

Nov. 3, 1922.

A. I. Root Co.

Council Bluffs, Iowa.

Gentlemen: Attention: A. H. Dunn.

We have made some very careful and thorough tests with several brands of foundation. Upon the conclusion of these tests our entire order for foundation was placed with you.

Our tests proved very conclusively that 400 pounds of Airco foundation produced for us slightly more than 2000 pounds more honey the first season than its nearest competitor would have done.

This is rather astounding when you consider that this saving more than paid for the entire cost of the foundation.

Yours truly,

Blackwell Honey Co.

Airco is milled at Council Bluffs, and sent to distributors at different points throughout the Middle West, in order that you can get your Airco Foundation with least possible delay, and at least expense.

The Wertz Seed Co., Sioux City, Iowa.
Foster Honey & Merc. Co., Boulder, Colo.
P. J. Polley, Mitchell, S. D.
O. G. Borton, Scotland, S. D.
Underwood & Sons, Lawrence, Kans.
Herschel Short, Guilford, Kans.
C. F. Buck, Augusta, Kans. (A. V. Small, Successor, now carries Airco).
Griswold Seed Co., Lincoln, Neb.
Carhart Lumber Co., Wayne, Neb.
Rodman Company, 301 Delaware St., Kansas City, Mo.
Lodge Grass Apiaries, Lodge Grass, Mont.

THE A. I. ROOT CO. OF IOWA

COUNCIL BLUFFS, IOWA

Crop and Market Report

Compiled by M. G. Dadant.

For our crop and maraket report for March we asked the following questions of contributors: 1. How much of the crop is left in the hands of producers? 2. How is the demand, wholesale and retail? 3. Do you anticipate much holdover of honey into the new crop season? 4. How are the bees coming through, so far, this winter? 5. What is the general outlook in your locality?

CROP ON HAND

Reports were universally alike in that they indicated that there is very little honey in the hands of producers east of the Mississippi River. There is probably not over an average of 5 per cent of honey left on hand, and this will practically all be cleaned up by the time the new crop is ready to market.

The shortage of honey is especially noticeable in the Southeast. Here the duty on West Indian and other honies has had the effect of shortening the supply, and as a result the honies of the Southeast have moved readily at a remunerative price. Several reporters state they could handle additional amber honey if they had some on hand now.

Texas reports practically all of its native honey out of the hands of producers, with a few cars of honey from other states having been imported this summer, which will probably have to be held over. There is considerable difficulty in disposing of this honey, inasmuch as the flavor is different from that of the native Texas honey and is not as well liked by the consumers there.

It is probable in the Inter-mountain territory that most of the extracted honey left on hand is being held. The eastern half of Colorado is well cleaned up of both comb and extracted, but a number of cars of extracted are being held on the western slope. There are several cars of extracted in Montana, but the producers there are well assured of disposing of same before the new crop comes in. Idaho seems to be holding quite a large percentage of her extracted crop, probably more than any other state. Arizona and New Mexico seem to have disposed readily of their crop, probably due also to the fact that they have not had the competition of the amber honies of the West Indies, etc.

Oregon, Washington and California report practically all of their crop disposed of before now.

THE HONEY DEMAND

The demand has been extremely slow since November, but in the last two or three weeks there has been an increase in demand which is especially noticeable just now.

This is not to be wondered at since in the last few weeks we have had a sharp advance in sugar, which at the date of the writing of this report, February 16, has reached a price of refined sugar in New York of $8.50.

Recent Government reports on the sugar supply seem to indicate that all of it is in the hands of refiners and that there is an apparent shortage of sugar over the demand for domestic consumption. This is due partly to large shipments abroad and also to the fact that the consuming public in the United States has been using more sugar during the past year than ever before by far.

While the reports do not indicate an acute shortage of sugar, still it seems, on the face of it, that sugar would be actually in short supply before the new crop is available and that prices would advance still farther.

THE HOLD OVER

There may be some hold over of extracted honey into the new crop, but practically all of this will be in the hands of jobbers and wholesalers, who will be in a position to hold at a remunerative price and not flood the market in any one point. Undoubtedly if this distribution was proper it would be an easy matter to dispose of all the present stocks of honey within a very short time by distributing it equally over such sections as have a consumption demand.

CONDITION OF BEES

The peculiar antics of climate and temperature this year are especially noticeable in the reports coming in this month. They would indicate that in the northern sections there have been heavy snows, which are especially noticeable from the eastern Indiana line eastward through the New England States. This extends through Michigan, Wisconsin and Minnesota, also as well as the Dakotas to a lesser extent. A little farther south there has been a practical absence of moisture, which is probably working against the best growth of the clover plants in this region.

THE OUTLOOK

It is too early to give any idea as to the honey prospects for the coming year. Those sections which have had ample rains or snows should be in good shape as far as honey plants are concerned whereas those with shortage of rainfall or moisture will have to depend on the betterment of conditions by rains during the balance of the winter and early spring.

At any rate, conditions do not seem to be abnormal, although there is apt to be a little larger winter loss than usual, owing to the peculiar climatic conditions existing in the different parts of the country.

SUMMARY

While two months ago it looked as if it would be an impossibility to dispose of the 1922 crop before the new crop was harvested, the sharp upturn in prices of sugar and the continued effort on the part of producers to market their crop, either locally or otherwise, are having a desirable effect, and it is not to be questioned but that all but a very small proportion, at least, of the 1922 crop will be disposed of before the new crop is ready.

Comb honey of the 1922 crop is all cleaned up, as well as some which was carried over from the year before and there is a demand which cannot now be supplied.

During the present market year two factors have been in evidence which have militated against the proper sale of honey. One of these is the large variation in retail prices as offered by different beekeepers.

In one locality of the country we learn of 5-pound pails of good honey selling as low as 50c, whereas other producers, who were trying to get a just and fairly remunerative price for their honey, were asking $1.15. This cannot help but hurt the whole industry, since it leads consumers to believe that either there is some misrepresentation in the article or else somebody is trying to make a huge profit.

The other point to be mentioned is the lack of proper grading, both in comb and extracted honey.

The grade proposed at the American Honey Producers' League meeting, and probably to be adopted by the Government soon, should help to remedy this, in case proper publicity is given and beekeepers come to a general usage of these grading rules.

In comb honey the lack of grading is just as evident.

We have a report from one of the secretaries of a state association to the effect that it is very difficult to place comb honey between members on account of the fact that one member will not be sure of the grading of the honey he buys from his neighbor. This is a deplorable fact, as it cuts down co-operation on the part of beekeepers to a large extent.

We certainly need great publicity in the matter of grading honey. It is unfortunate that we cannot all follow comb honey grading rules such as those of the Colorado Honey Producers' Association, and put on the market a uniform article which can be purchased by one beekeeper from another without any danger of getting poorly graded stuff.

ANNOUNCEMENT

Pure Bred Carniolan Queens

We wish to announce to the beekeepers of America that we are offering pure-bred Carniolan queens for the season of 1923.

Have you ever tried this vigorous gray-banded honeybee? If not, it is because you are not acquainted nor familiar with their superior qualities. Impartial authorities readily admit that Carniolans are much gentler, hardier, much more prolific, better winterers and, lastly, gather proportionately more honey per colony than Italians. Progressive beekeepers are demanding more and more bees that will live up to such a high standard of excellency. They are finding that Carniolans are able to deliver the goods.

Further, Carniolans have a much longer tongue, a larger carrying capacity, and as winterers they are unexcelled. In the early spring they come out undiminished in strength and vitality. Result: No spring dwindling, less foulbrood, and every colony all ready for your earliest honey flow when it comes.

DON'T BE DECEIVED by what a few prejudiced breeders and writers have said about this hardy race. Their purpose has not been to inform you of their merits—only to knock them. Again, don't be misled by what they have claimed as to the swarming propensity of the Carniolan bee. They gained this reputation in the early comb-honey era, at the time of the one-story 8-frame hive, with the no less spacious comb-honey super for surplus. No wonder they swarmed! With the increased use of larger hives, allowing the queen ample breeding space, coupled with more skillful management, this objection has fast disappeared.

Our Carniolans are bred from stock we imported direct from Carniola. **They are pure.** In buying Carniolans it is very essential that you take this into consideration.

WRITE for our circular, which gives you more fully the merits, management, prices, etc., of our Carniolans. It also gives you some scientific and accurate data relative to the other different races of bees. It's worth money to you! Write for it today!

W. A. HOLMBERG, Denair, Calif.

ATTRACTIVE PRICES

on package bees, nuclei and queens. A 2-lb. package with select untested queen, in lots of 25 or more at $4.

Other sizes in proportion. Also want to quote you on your queen requirements. Write for circular and prices, telling, if possible, what you think you will need.

R. V. STEARNS,
Brady, Texas.

Early Orders for March

Given Prompt Attention

Very best 3-band Italian Queens

Untested ..... $1.00 each
Tested ..... $2.00 each

No Disease.

D. W. HOWELL,
Shellman, Ga.

Four, Twenty Comb Queens

In April, 1921, one queen, daughter of St. Romain's Honey Girl, developed to occupy 20 combs in Hoffman frames for brood. Since that time I have produced one other daughter and two granddaughters that developed to same capacity.

Chaffee-Crites Bee Farms, Amenia, N. D., have leased St. Romain's Honey Girl for the season.
I have booked nearly all tested queens offered in January advertisement.
Packages and nuclei with untested queens for April, May and June deliveries:

2-lb. package, or 2-frame nucleus, $4.75; 25 or more, $4.50 each.
3-lb. package, or 3-frame nucleus, $6.25; 25 or more $6.00 each.
4-lb. package, or 4-frame nucleus, $7.25; 25 or more, $7.00 each.
Pound packages shipped with comb.

Guarantee: To replace mismated queens if any are mismated; to deliver safely to your Express Station; to give reasonable satisfaction; to furnish certificate of inspecction with each shipment.

Twenty per cent with order to secure it, balance about fifteen days before shipment.

After the package shipping season, I will maintain a queen yard of about four hundred at my Latanier queen yards and use breeders that are either twenty-comb queens, or mothers of twenty-comb queens. Apply for prices; state quantity wanted.

J. L. St. ROMAIN, Apiarist.

White Clover Farm & Apiary, Hamburg, Iowa

NUCLEI **QUEENS** POUND PACKAGES

FINEST ITALIANS. SELECT BREEDING

QUEENS: Untested, 75c each, $70 per 100. Select untested, $1.00 each; tested, $1.25 each, postpaid. Breeders, $5 and $7.50 introduced in a one-frame nucleus.

NUCLEI: Two-frame, with young queen, $5; 25 or more, $4.50 each. Three-frame, with young queen, $6.50; 25 or more, $6 each.

PACKAGES: Queens caged separately among the bees. Two pounds with untested queen, $4.50; 25 or more, $4 each. Three pounds with untested queen, $6; 25 or more, $5 each.

Naturally, when you think of buying bees, you wish to get the best Honey Gatherers possible. The strongest Nuclei, and Full Weight Packages. Healthy, disease-resisting, gentle stock. Queens that will fill the hives to overflowing with bees in time for the surplus crop. (We furnish the above. Your P-R-O-P-E-R management spells S-U-C-C-E-S-S).

"N. C. Jensen, owner and manager of these apiaries, has, during eight years in the Southwest and South, operated several hundred colonies of bees each year and prepared for shipment thousands of packages and nuclei. In queen rearing, running as high as 2,000 nuclei and in the single season of 1919, with one assistant, reared over 13,000 queens."

Signed, N. C. Jensen.

For a square deal, address your orders to

JENSEN'S APIARIES, CRAWFORD, MISS.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 15th of each month preceding date of issue: If intended for classified department it should be so stated when advertisement is sent.

BEES AND QUEENS

ATWATER honey, small lots 8½c; car lots 8c.; package bees, also.

HAVE YOU READ our display ad in this number? If not, look on page 148.
Holmberg, Denair, Calif.

ELIGIBLE QUEENS—Special sale of a limited number of my select tested queens eligible for breeding. Bright 3-banded Italians, 3-frame nuclei with tested queen, $10, on Hoffman wired frames. The cream of my yard, and are something worth while. I have never had any bee disease in my yard. A queen breeder for 46 years. Safe arrival guaranteed. Terms 10 per cent to book order, or 6 per cent discount cash with order. Can deliver these nuclei in May.
J. W. Bittenbender, Knoxville, Iowa.

FOR SALE—2 pounds hustling bees and young Italian queen, $4. Special price on large orders and queenless packages. Write me for prices. Health certificate with each shipment. Safe delivery and satisfaction guaranteed.
J. L. Leath, Corinth, Miss.

THAGARD'S ITALIAN QUEENS—We have succeeded in originating a strain of Goldens that has all the good qualities of the three-bands and retains the color of the goldens; 1 to 12, $1.25; 12 and over, $1.10.
The V. R. Thagard Co., Greenville, Ala.

WARRANTED pure mated Italian queens, will be ready to send by the latter part of May or June 1, mailed in special sure introducing cages. Give me your order now, pay when you want the queens, $1.25 each. No honey used in candy.
Daniel Danielsen, Brush, Colo.

FOR SALE—15 colonies bees. 2-story ten-frame, $15.00; 1-story ten-frame, $12.00; 2-story eight-frame, $12.00; 1 story eight-frame, $10.00. On full sheet wired foundation. Metal roof covers. First-class condition; nearly new.
L. M. Mason, Streator, Ill.

OUR CLOVERS, as well as our bees, are wonderful honey producers. Hulled scarified seed guaranteed to be 50 per cent pure annual and the balance pure bi-ennial, at the following low prices, express or postage prepaid: 100 pounds and up, 15c a pound; 50 pounds up to 100 pounds, 17½c a pound; 25 pounds up to 50 pounds, 20c a pound, and in 5 and 10 pound lots, 25c a pound. Germination guaranteed to please.
M. C. Berry & Co., Montgomery, Ala.

THE LAST QUEEN FROM ITALY—I imported her. I still own her. She goes to the south this spring.
W. A. Holmberg, Denair, Calif.

CONNECTICUT QUEENS—Highest grade 3-banded Italians. Ready June 1st. Untested, 1, $1.15; 12, $12; 50, $47.50; 100, $90. Two-pounds bees with queen, $4.50; 3 pounds with queen, $5.50; two-frame nucleus with queen, $5; 3 frames with queen, $6. No disease. Safe arrival and satisfaction guaranteed. Conn. Valley Apiaries.
A. E. Crandall, Berlin, Conn.

TRY THE ACHORD STRAIN OR ITALIANS—They have helped produce wonderful honey crops in many states. Good-natured, nicely marked, vigorous three-banded Italians. Bred in two of the largest, best equipped queen-rearing apiaries in the South, and shipped to you in clean, convenient, up-to-date packages, with full instructions for hiving. Delivery April 15th and later. Express or mail shipment. By express, 1 lb. bees, $2.25 each; 25 or more, $2.15 each; 2 lbs. bees, $3.75 each; 25 or more, $3.50 each; 3 lbs. bees, $5.25 each; 25 or more, $5 each. If wanted by parcel post add 15c each to the price of the 1-lb. size and 25c each to 2 and 3-lb. sizes. Also add postage. Mailing weight of the 1, 2 and 3-lb. packages is 4, 6 and 8 pounds each, respectively. Select untested queens for the above packages, or for mailing, $1.25 each; 10, $11.50; 25, $25. Young tested queens, $1.75 each. Order early and state date you wish shipment. You will not be disappointed in the stock and service we give you. For a more complete, descriptive price list, send a postal with your address.
W. D. Achord, Fitzpatrick, Ala.

FOR SALE—Other lines requiring our exclusive attention, we offer bees, supplies and equipment at a sacrifice. Are you going to profit by this? Write for price list, let us know what you need.
Nordstrom Bros., Gallitzin, Pa.

PINARD'S quality of Italian queens and package bees. Laying, untested queens, $1 each. Write for prices on large lots. Circular free.
A. J. Pinard, Morgan Hill, Calif.

27 YEARS of select breeding gives us bees of wonderful qualities. None better and few as good.
M. C. Berry & Co., Montgomery, Ala.

PACKAGE BEES for Idaho, Oregon, Washington, Montana, and British Columbia. Buy near home and get bees full of vigor and vitality; 1,200 colonies to draw from. Write for prices, naming desired date of shipment. E. F. Atwater, Meridian, Ida.
Established here in 1901. Former Field Agent in Beekeeping, U. S. Dept. of Agr.

DELIVERED—Pure Italian bees and queens. Two-pound packages with selected queen, 1-10, $4.75; 12-24, $4.60; 25-50, $4.50; 50 or more, $4.40. Not delivered, at 50 cents per package less; 25 per cent cash books order. Queens, $1, or $10 per dozen. We ship on date specified; begin shipping April 15; safe arrival and satisfaction guaranteed. We ship only the best.
W. C. Smith & Co., Calhoun, Ala.

READ my display ad in this number. It has a message for you.
Holmberg, Denair, Calif.

FOR SALE—300 colonies of bees in A-1 condition, $6 for 8-frame hives and $7 for 10-frame hives, with or without location.
Chas. Heim & Sons,
Three Rivers, Texas.

TWO-POUND PKGS. Italian bees with unt. queens, $4.50 each, 15 or more $4 each. Complete satisfaction guaranteed.
J. J. Scott, Crowville, La.

FOR SALE—100 colonies hybrid bees in 8-frame hive at $5 per colony if taken by March 15. Write for particulars.
Jas. Johnson, Pocahontas, Ark.

MOTT'S Northern bred Italian queens. Sel. untested, $1; Sel. guaranteed pure mated, $1.25; Sel. tested, $2.50. Pound packages in June. Plans "How to Introduce Queens" 25c. E. E. Mott, Glenwood, Mich.

BUY NEARER HOME—2 lbs. bees with Italian queen on frame of foundation, $5.75. Write for queen circular.
The Scott Apiaries, La Grange, Ind.

FOR SALE—Three-frame nuclei hybrid bees with guaranteed pure untested Italian queen, $5 each. Safe arrival guaranteed.
Carl L. Wilson Apiaries,
Mt. Vernon, Ga.

ATTRACTIVE PRICES on package bees, nuclei and queens. A 2-lb. package with select untested queen, in lots of 25 or more, at $4. Other sizes in proportion. Also want to quote you on your queen requirements. Write for circular and prices, telling if possible what you think you will need.
R. V. Stearns, Brady, Texas.

CALIFORNIA package bee business and apiaries for sale at a sacrifice. Because of other conflicting interests, I am offering these at the snap price of $1,750. Inquiries and inspections welcomed. References on request. G. T. Johnson,
165 Raymond, Ave., San Jose, Calif.

FOR SALE—50 colonies 10-frame, $8 each.
H. H. Rohwer, Ft. Calhoun, Neb.

QUEENS—$1.00 each. Package bees on 1 brood frame. "That bees will build to bottom bar.", free with each queen or package bees.
F. M. Russell, Roxbury, Ohio.

AN EXTRA PLAN for those wanting nuclei, get an 8-frame colony with queen and one extra queen. On arrival, divide and make two 4-frame nuclei. All for $10, any time after March 10th.
Curd Walker, Scotts Station, Ala.

WE ARE BOOKING orders now for spring deliveries. Bright Italian queens, untested $1.00; six, $5.00; 100, $75. Virgins 50c each, 100, $40. P. B. Skinner,
Greenville, Ala.

FOR SALE—160 colonies of bees in good condition. All in 8-frame Heddon hives; also a large supply of comb and extracting supers and 60-lb cans in double cases. For particulars write. Mrs. J. C. Wheeler,
622 S. Austin Boulevard, Oak Park, Ill.

NUCLEI and package bees. Foulbrood unknown in this district. Send for prices, giving amount desired.
P. H. Benson, Palo Verde, Ariz.

PURE BRED CARNIOLAN QUEENS—Pure Carniolans are gentler, more vigorous, much more prolific and better honey gatherers than any Italians. Hardy, disease-resisting, longer-tongued, better winterers—they have no superiors. We are breeding from stock we imported direct from Carniola. Write for circular.
W. A. Holmberg, Denair, Calif.

NUCLEI and package bees; send for circular.
Allen Latham, Norwichtown, Conn.

GOLDEN ITALIAN QUEENS—None better. One, $1.00; six, $5.00; twelve, $10. Select, one, $1.25; six, $7.00; twelve, $13. Virgins, one, 60c; 12, $5.00. Clipped when requested; ready April 15. Money baccк if not satisfied. Crenshaw County Apiary,
Rutledge, Ala.

FOR SALE—550 colonies bees in standard hives, young queens; complete modern extracting equipment; free from disease; good locations; established market. If interested write for particulars. A. E. Schellhorn,
Route 3, Billings, Mont.

FOR SALE—3-banded Italian bees on wired Hoffman frames for June delivering; 2-frame nuclei with tested queen, $6.50; 2-frame nuclei with untested queen, $5.50; 3-frame nuclei with tested queen, $7.50; 3-frame nuclei with untested queen, $6.50; 2-lb. package with tested queen, $6.50; 2-lb. package with untested queen, $5.50; 3-lb package with tested queen, $7.50; 3-lb. package with untested queen, $6.50. Tested queens, $2 each; untested queens, $1.25; 3 or more 10 per cent less. Safe arrival guaranteed; no disease. Terms, 10 per cent to book order, or 6 per cent discount cash with order.
J. W. Bittenbender, Knoxville, Iowa.

ITALIAN BEES AND QUEENS—1 frame of brood and bees, 1 pound of bees, 1 Italian queen, $5.00. Additional frame of brood or 1 pound of bees with above, $1.00. Queens only with packages.
H. P. Le Blanc, 2938 Palmyra St.
New Orleans, La.

POUND PACKAGES nuclei and queens—One frame of brood and bees, one extra pound of bees and one young Italian queen, $3.00. Read my large ad in this issue before placing your order.
Brazos Valley Apiaries, Gause, Texas,
H. E. Graham, Prop.

BEES in packages; pure Italian stock; vigorous queens. See my display advertisement, this issue.
C. M. Elfer, St. Rose, La.

SHE-SUITS-ME QUEENS—1923, after June 1, $1.50 each. One dollar per queen when ordered four weeks or more in advance.
Allen Latham, Norwichtown, Conn.

I AM BOOKING ORDERS now for next spring delivery, 3-frame nuclei and queens at the same price as last year. Caucasian or Italian race.
Peter Schaffhauser, Haveloc!, N. C.

BEES AND QUEENS—I am now booking orders for early spring delivery. Have best strains of Italian bees. Write for prices.
N. L. Stapleton, Colquitt, Ga.

BIG bright Golden Italian Queens, the kind that are bred for beauty and also honey gathering qualities. We guarantee to please you. Price, untested, $1.25 each, 6 for $6.00, 12 for $11.00; $85 per 100. Tested, $2.00.
Honoraville Bee Co., Honoraville, Ala.

FOR SALE—Missouri bred Italian queens, $1 each; 6 for $5. L. E. Atwein,
1206 N. 13th St. St. Joseph, Mo.

IF YOU are in the market for bees and queens for April, May and June (1923) delivery place your order now. Two-frame nuclei with select untested queens, $4 each; 3-frame nuclei with select untested queens, $5 each; three-banded Italian queens, select untested $1.25 each; select tested $2.50 each; select tested breeding queens, $6 each. For carload lots write for special prices. Fifteen per cent deposit to book order, balance payable just prior to shipment. Safe arrival and satisfaction guaranteed.
J. P. Anthony, Apalachicola, Fla.

IF YOU WANT good, bright Italian queens by return mail, send your orders for queens to us; $1 each; $11 per dozen, $80 per hundred. Safe arrival, pure mating and reasonable satisfaction guaranteed in U. S. and Canada. One pound bees with queen, $3; 2-lbs bees with queen, $5. We pay delivery charges up to 1,000 miles and guarantee safe arrival in U. S. and Canada. No disease in our apiaries.
Graydon Bros., Rt. 4, Greenville, Ala.

IMPORTED QUEENS are a thing of the past for a while, at best, but my breeders from the last queen from Italy are producing excellent results. Price, 1, $1.25; 6, $7; 12, $13; 25 or more, $1.00 each.
M. G. Ward, Lathrop, Calif.

BEES AND QUEENS—See our large ad elsewhere in this issue. J. L. Morgan, Apalachicola, Fla.

FOR SALE—Golden queens of 15 years' careful breeding; untested, $1.25 each, or 6 for $7.00; 12 or more, $1.00 each. Tested, $2.00 each. One-lb. package with untested queen, delivered, $3.25; 2-lb. package with untested queen, delivered, $5.00. Promptness and satisfaction my motto. Shipments beginning about April 15.
R. O. Cox, Box 25, Rutledge, Ala.

BOOKING ORDERS for May delivery. Prize-winning 3-banded Italian bees. 2-lb. package, with select untested queen, $5; 10 packages or more, $4.75 each; 3-lb. package with queen, $6.75. I guarantee safe delivery and satisfaction.
C. H. Cobb, Belleville, Ark.

PETERMAN'S QUEENS have the name and reputation of being leaders in quality, size and color. I sort out and ship only a large select, thrifty laying queen, killing all that do not come up to this standard. The past season proved to me this pays big for repeat orders. Prices: 1, $1.25; 6, $7.00; 25 at $1.00 each. Circular free.
H. Peterman, R. F. D., Lathrop, Calif.

THAGARD'S ITALIAN QUEENS—Bred for quality. Our three-banded breeder came direct from Italy. They have made high honey records for thousands of beekeepers in the past; 1 to 5, $1.25; 6 to 11, $1.20; 12 or more, $1.10 each. Get our prices on package bees.
The V. R. Thagard Co., Greenville, Ala.

YES our clovers, as well as our bees are great honey producers. They do well together. Try some of both.
M. C. Berry & Co., Montgomery, Ala.

GOLDEN QUEENS, GOLDEN—Ready after April 1. Untested, 1, $1.25; dozen, $11; select untested, 1, $1.50; dozen, $13.50. Write for prices on nuclei and pound packages. Pure mating and safe arrival guaranteed in U. S. and Canada.
Tillery Bros., R. 5, Greenville, Ala.

PACKAGE BEES for 1923 delivery, Burleson's "Old Reliable," three-banded Italian bees and queens. None better; two (2) pound packages, $4.25, and three (3) pound packages $5.50 each. Select untested queen with each package. Ten per cent (10%) down with order, balance fifteen (15) days before bees are to be shipped. I use sugar syrup for feed in transit and guarantee no disease and safe arrival.
T. W. Burleson, Waxahachie, Texas.

NUCLEI—June and July delivery; large, strong 3-frame nuclei with queen, at $4.75 each; lots of 10 at $42.50.
The Foster Honey Company, Boulder, Colo.

QUEENS—High-grade Italian queens, three-banded; also goldens. Untested, 1, $1.25; 6, $6.50; 12, $12.00. Tested, 1, $2.00; 6, $11.50; 12, $22.00. If other grades of queens are wanted, write for prices. Orders booked for one-fourth cash, prices for April, May and June. Safe arrival and satisfaction guaranteed. We will replace all mismated queens. No disease. P. O. Watkins, Cullasaja, N. C.

GOLDEN ITALIAN QUEENS—Produce bees solid yellow to tip; disease resisting, prolific, gentle and good honey gatherers. Untested, $1.25; select untested, $1.50 each; tested, $3.00.
Dr. White Bee Company, Sandia, Texas.

OLD, RELIABLE QUEEN-BREEDER—In bee work 22 years. Three-banded queens, 3-frame nuclei, packages and full colonies, any quantity. Ready after April 1.
Curd Walker, Scotts Station, Ala.

DO YOU NEED QUEENS?—Try mine; you cannot beat the quality at any price. Am working for the name of being honest and reliable, selling the best queens. Let me show you. Circular with prices free.
H. Peterman, R. F. D., Lathrop, Calif.

THREE-BANDED ITALIAN QUEENS—Select untested, $1 each; $10 per dozen. Pound packages of bees; golden Italian queens at above prices; honey gatherers (no disease). Satisfaction guaranteed.
W. T. Perdue & Sons, Fort Deposit, Ala.

PACKAGE BEES for 1923—Now booking orders for Yancey Hustlers. See larger ad for prices. Caney Valley Apiaries, Bay City, Texas, Yancey Bros., Owners.

FOR SALE—1923 golden Italian queens, $1.25; dozen, $12. Safe arrival and satisfaction guaranteed
J. J. Sanford & Son, McKenzie, Ala.

FOR descriptive price list of Carniolan, Caucasian, Italian and Golden queens, write to Grant Anderson, Rt. 2, Waco, Texas.

BURLESON'S "Old Reliable Three-banded Italian Queens," guaranteed none better. Untested, $1.25 each; $12 per dozen. Select untested, $1.50 each; $15 per dozen. Queens ready to ship April 10th. Send all orders, with remittance, to my manager, J. W. Seay, Mathis, Texas.
T. W. Burleson, Waxahachie, Texas.

QUEENS, QUEENS—From my old leather-back Italian queen. She is the head of my apiaries. Ready to ship after April 15. Untested, $1.25; 12, $1 each. Select untested, $1.50; 12, $1.25 each. Tested, $2.50; 12, $2.25 each. Select tested, $3.00 each. O. O. Wilder & Son, Rt. 2, Box 14, Corpus Christi, Texas.

NUCLEI, PACKAGE BEES and ITALIAN QUEENS for spring delivery, the kind customers recommend to their friends. We have been shipping queens and bees for many years and aim to please our customers. Three-banded Italian queens, untested, $1; tested, $2. Write for price list on breeders, combless bees and nuclei.
Allenville Apiaries, Allenville, Ala.

CARNIOLANS—No better strain can be found in the United States than stock my Carniolan queen yard. Price, 1, $1.25; 6, $7; 12, $13; 25 or more, $1 each.
M. G. Ward, Lathrop, Calif.

3-BAND ITALIANS, developed from the best and most popular strains by continuous selection. When I can produce or discover better, they will be adopted. Queens, untested, after May 15, $1.50 each, 6 for $8. Tested, $2.50 each. CARNITALIANS—Five miles from my Italian yard I raise Carnitalians, a cross derived from Jan Strgar Carniolan queens and Golden Italian drones. I calculate fifty years to get color marking fixed. Don't wait for that; the blend of blood and quality is there now. Tested queens, after June 1, $2.50 each.
John Protheroe, Rustburg, Virginia.

HAVE YOU read Hiram Bear's advertisement on page 152? Do so before placing your order for bees.

PACKAGE BEES—2000 big, strong, healthy colonies; will be ready to supply package bees in the spring. Italian or Carniolan queens. Let me quote prices and book your order early. A small deposit reserves shipping date. Circular free.
J. E. Wing, 155 Schiele, Ave., San Jose, Calif.

GOLDEN ITALIAN QUEENS for 1923, the big, bright, hustling kind. Satisfaction guaranteed. Price, untested, $1 each, 6 for $5, 12 for $10, $75 per 100. Tested, $1.75 each; also a few 1 and 2-frame nuclei. Write for prices on nuclei.
E. F. Day, Honoraville, Ala.

PACKAGE BEES and nuclei. See add on page 142. Lovitt Honey Co., 602 N. 9th Ave., Phoenix, Ariz.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad. elsewhere.
Nueces County Apiaries, Calallen, Texas.
E. B. Ault, Prop.

OUR NEW BOOKLETS telling all about our bees and our clovers are now ready to mail. Let us mail you one.
M. C. Berry & Co., Montgomery, Ala.

SEE my display ad. in this number.
Jes Dalton, Bordelonville, La.

ITALIAN BEES, brood and young queens for delivery April 15 to June 15. One frame emerging brood and bees, one extra pound of bees, one young Italian queen, all for $5.00; 25 or more, $4.75; 50 or more, $4.50. Bright three-banded stock only; no disease; safe arrival and satisfaction guaranteed; 25 per cent deposit to book order.
R. S. Knight, R. F. D. 2, New Orleans, La.

SEE MY DISPLAY ADV. for package bees, queens and nuclei.
W. H. Moses, Lane City, Texas.

FOR SALE—60 colonies bees, with location or without location.
Carl Sommerdorf, Brownton, Minn.

"FLORIDA FIRST" QUEENS for April, May and June, $1.50 each; 5 for $7. Early order discounts during January and February. Circular free. R. C. Boswell, Manager, Indian River Apiaries, Wilson, Fla.

BEES AND QUEENS at reduced prices. Cypress hives for sale. Write for terms.
Otto Diestel, Elza, Ga.

HARDY ITALIAN QUEENS, $1 each.
W. G Lauver, Middletown, Pa.

CARNIOLAN QUEENS—None better. Select tested, $2.50 each; select untested, $1.25 each. Also choice Italians, same prices. Send for circulars.
Geo. W. Coltrin & Son, Mathis, Texas.

MY BREEDING STOCK contains breeders from the last imported queen from Italy, and they are good queens.
M. G. Ward, Lathrop, Calif.

HONEY AND BEESWAX

ATWATER honey, small lots 8½c; car lots 8c.; package bees, also.

FOR SALE—Clover extracted honey in second-hand, 60-pound cans, 120 pounds net, $11 per case.
Sylvester Legat, Spring Valley, Ill.

WANTED—1 or 2 cars of white extracted honey (in new 60-lb. cans), or similar amount in 1 to 5-ton lots. If satisfactory I will call on those mailing sample and quoting lowest spot cash price. A. W. Smith, Birmingham, Mich.

FOR SALE—Two-tons white comb honey at reduced prices; also dark extracted; state your wants. H. G. Quirin, Bellevue, Ohio.

FINE ALFALFA clover honey, carlot, 8c lb.; smaller lots 8½c; case 12 5-lb. pails, $7.20; 6 10-lb. pails, $6.60.
E. F. Atwater, Meridian, Idaho.

1000 LBS. clean, bright yellow refined beeswax, 1922 crop.
Edw. A. Winkler, Rt. 1, Joliet, Ill.

FAMOUS Nevada white alfalfa honey. Carload, 7½c per lb., cash, f. o. b. Fallon, Nev. C. E. Andrews, Box A 334, Fallon, Nevada.

FINE QUALITY extracted white clover honey, $14 per 120-lb. case.
J. G. Burtis, Marietta, N. Y.

WHITE CLOVER HONEY, case of 130 lbs., new cans, $13.80.
Strifert & Erickson, Stewartville, Minn.

EXTRA choice clover honey in new cases. 120-lbs. net $13 per case. Only 50 cases left; 25 cases light clover comb honey at $3 per case, 24 sections; also a few barrels soiled sugar for feeding.
Edw. A. Winkler, Rt. 1, Joliet, Ill.

FOR SALE—Fancy white clover comb honey in 4¼x5 sections; 24 section cases, 6 or 9 cases to the carrier. Write for prices. Our honey won first premium at Illinois State Fair and also at Council Bluffs, Iowa.
Aaron Coppin, Wenona, Ill.

WANTED—White clover chunk and white clover extracted honey.
W. A. Hunter, Terre Haute, Ind.

CLOVER and amber fall honey in 60-lb cans for sale. Samples and price on request.
C. S. Watts, Monticello, Ill.

FOR SALE—Raspberry blend honey, 60-lb. cans or 5-lb pails.
George Jaquays, East Jordan, Mich.

CLAFONY quality clover honey (liquid or crystal), 15 5-lb. pails $11.25; 165 pails, $69; 816 pails, $180.
Clarence Foote, Delanson, N. Y.

FOR SALE—Extra fancy white clover honey put up in 2½, 5 and 10-pound pails, and 60-pound cans; also good fall honey. Write for prices. Sample by mail 15c.
J. M. Gingerich, Kalona, Iowa.

WANTED—Basswood honey, of good quality, for table use, or other grades of honey except clover. Send sample and price.
J. K. Wolosevich, 730 1st Ave., Milwaukee, Wis.

FOR SALE — White and amber extracted honey. Write for prices. State quantity wanted. Dadant & Sons, Hamilton, Illinois.

HONEY FOR SALE—In 60-lb tins; water white orange, 14c; white sage, 12c; extra light amber sage, 10½c New York State buckwheat, 10c, for immediate shipment from New York.
Hoffman & Hauck, Woodhaven, N. Y.

HONEY SALE—Some extra choice clover honey; state quantity. Satisfaction guaranteed. Maplewood Apiaries, Dubuque, Iowa.

FOR SALE—Comb and extracted honey.
W. C. Moon, Henry, Ill.

FOR SALE—9 barrels extra fine extracted white clover honey, 7 barrels fine light amber fall honey. Can put this honey up in 60-lb. tin cans and 5 and 10-lb. tin pails. Purity and quality guaranteed. Prices on application if you state quantity wanted. Sample 10c.
Emil J. Baxter, Nauvoo, Ill.

FOR SALE — Michigan milkweed,-raspberry white honey, mild and deliciously pleasing. In 60-pound cans, at 12½c per pound.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request.
Dadant & Sons, Hamilton, Ill.

FOR SALE—White honey in 60-lb. cans; also West Indian in 50-gal. barrels. Samples and prices on request. A. I. Root Co.,
23 Leonard St., New York City, N. Y.

FOR SALE—Bees, comb and extracted honey.
A. L. Kildow, Putnam, Ill.

FOR SALE—Choice clover extracted honey in case or carload lots. Comb honey in Danz. and Beeway sections, packed in 6 or 8-case carriers. Quality unexcelled.
J. D. Beals, Oto, Iowa.

BEESWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire. Dadant & Sons. Hamilton, Ill.

SUPPLIES

ATWATER honey, small lots 8½c; car lots 8c.; package bees, also.

FOR SALE—Hubam annual sweet clover seed. Grown in rows and kept perfectly clean, therefore absolutely pure, 50c per lb., f. o. b. Holgate, Ohio.
Noah Bordner, Holgate, Ohio.

NEW OBSERVATION HIVES—One single-story and one one-and-one-half story. Root make; $15 gets them. H. A. McCarley,
2216 So. Ervay St., Dallas, Tex.

ADAPTABLE BEEHIVES are sound in principle and are practical. For free information address
Geo. P. Wood, Peekskill, N. Y.

FOR SALE—Dadant's Light Brood Comb Foundation in 25 and 50 pound boxes at 60 cents per pound.
Lake Region Honey Co., Birchwood, Wis.

SEE OUR LARGE AD. of bees elsewhere. Price of clover seed in classified elsewhere. Plant some for your bees.
M. C. Berry & Co., Montgomery, Ala.

FOR SALE—Second-hand hives. 15 2-story single-wall hives, frames, cover and bottom, $1.50 each; 20 double wall 8-frame Root hives, full size and Ideal extracting supers, $2.50 each; 13 Woodman 10-frame double-wall hives, $3.50 each.
A. Mottaz, 645 1st Ave., Ottawa, Ill.

FOR SALE—One hundred new Alexander bee feeders for 8-frame hives, 25c each.
Geo. H. Frey,
General Delivery, Cedar Rapids, Iowa.

FOR SALE—Bowers' adjustable division boards; never too short, never too long, always just right. Holds position, packing material cannot move it. Fits tight, retains warmth, keeps cold out. Hive body instantly made small, medium or large. Purchasers pleased. Not one request for money back, so far. Warranted. If not satisfied, ask money back. ; you are to be judge. Circulars, prices, etc.
F. D. Bowers, Sugar Grove, Pa.

FOR SALE—Five long-idea hives, insulated all around. Double 10-frame. Excellently made, $5 each.
O. W. Johnson, Le Grand, Iowa.

FOR SALE—Regular Hoffman self-spacing frames, $4.00 per hundred, Ideal self-spacing, $3.00 per hundred.
E. G. Lewis, Beeville, Texas.

ADD 5c a pound to price of seed when ordering for Canada. See prices elsewhere in classified.
M. C. Berry & Co., Montgomery, Ala.

BEE EQUIPMENT—For extracted or comb honey. Write for prices.
The Foster Honey Company, Boulder, Colo.

CONNECTICUT and Rhode Island headquarters for Root's Beekeepers' supplies.
A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—40 one-story old style Dadant hives, made of white pine and well painted.
John W. Johnson, Rt. 6, Kirksville, Mo.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.
The Colorado Honey Producers' Association,
Denver, Colo.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.
American Bee Journal, Hamilton, Ill.

FOR SALE

ATWATER honey, small lots 8½c; car lots 8c.; package bees, also.

FOR SALE—My home in city, and 125 colonies bees. A. G. Turner, Sterling, Colo.

HUBAM—Genuine pure certified recleaned scarified Hubam seed. Most wonderful honey plant; blooms from June till November; produces a white, delicate-flavored honey similar to white clover; an insurance against crop failures and fall feeding. A boon to the farmers for soil building, pasturage, hay, ensilage, etc. Write for prices.
Edw. A. Winkler, Rt. 1, Joliet, Ill.

FOR SALE—Hubam and sweet clover seed.
Roy Wood, Moorhead, Iowa.

BEES AND GOATS work well together. Pure blood registered Toggenburgs, bucks and does, for sale. Will crate and ship anywhere. Pedigrees sent on request.
Jas. B. Prewit, Elsinore, Calif., Box 5.

TEN-ACRE FRUIT RANCH, principally commercial apple trees, situated in well improved irrigated district, land adjoining for farming can be rented. Good roads, churches and school. Seven-room bungalow with hot and cold running water; 100 colonies of Italian bees; no disease; motor extractor. Well established wholesale trade. Sweet clover and alfalfa honey. Will sell or exchange for place of similar value, south or southeast preferred.
Box 214, Springer, New Mexico.

SESAMUM SEED for sale, 30c for one-quarter pound, $1 a pound. Fine chicken food and bee plant.
J. H. Baughan, Gay, Ga.

GLADIOLI BULBS, blooming size; mixed, $2 per hundred. Choice varieties.
Van Wyngarden Bros., Hebron, Ind.

MOUNTAIN BRED ITALIANS—Nuclei, $5 and $6. See advertisement on page 152.
Hiram Bear, Hinton, West Virginia.

FOR SALE—Apiary in Salt River Valley, Arizona, consisting of 160 live colonies, sufficient supers, frames, etc., for 250 colonies, portable, extracting house, power equipment and an abundance of miscellaneous equipment. Write: J. W. Wright, Box 699, Safford, Ariz.

APIARY FOR SALE—Five well located apiaries equipped for extracted honey production for sale at exceptionally low prices.
Foster Honey Company, Boulder, Colo.

FOR SALE—1,000 extracting supers with comb; no disease. Pure buckwheat flour and extracted clover honey; also 300 colonies of bees.
Chester E. Keister, Orangeville, Ill.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—10-frame beehives, metal roofed. Price reasonable. Prompt service.
Thomas Cordner, Sparta, Wis.

CARNIOLANS and ITALIANS—I am doing my own work, and I am out to give the service you expect. Give me a trial and I will prove it. M. G. Ward, Lathrop, Calif.

FOR SALE—Good second-hand 60-lb cans, 2 cans to a case, boxed, at 60c per case, f. o. b. Cincinnati. Terms cash.
C. H. W. Weber & Co., 2163 Central Ave.
Cincinnati, Ohio.

FOR SALE—60 colonies of bees. Healthy and in up-to-date good hives.
Duane Shaw, Palestine, Ill.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request.
Dadant & Sons, Hamilton, Ill.

BEES FOR SALE—Nuclei or colonies. Write for special prices on large quantities.
Box 437, Boulder, Colo

FOR SALE—Beautiful collie pups; eligible to registry, from champion blood lines. Priced reasonable.
Everett Preston, Cutler, Ill.

MISCELLANEOUS

ATWATER honey, small lots 8½c; car lots 8c., package bees, also.

CASH for old bee books and journals. Write to me what you have. Francis Jager,
University Farm, St. Paul, Minn.

THE BEE WORLD—The leading bee journal in Britain, and the only international bee review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a postcard today. It is well worth your little trouble.

STRAWBERRY PLANTS — Senator-Dunlap exclusively, $4.00 per 1,000; good stock, well grown.
S. D. Parks, Brownville, Neb.

PLANS FOR POULTRY HOUSES—All styles, 150 illustrations; secret of getting winter eggs, and copy of "The Full Egg Basket." Send 25 cents.
Inland Poultry Journal, Dept. 56,
Indianapolis, Ind

HON-E-NUT CANDIES—Made from pure honey, nuts and chocolate. The most wholesome candy made. Try it and be convinced; $1 per pound, postpaid.
Fairmount Apiaries, Schuylkill Haven, Pa.

SITUATIONS

ATWATER honey, small lots 8½c; car lots 8c.; package bees, also.

EXPERIENCE AND FAIR WAGES to active, industrious young man for help in well-equipped apiaries. Six hundred and fifty colonies April to December. State age, height, weight, occupation and wages desired.
The Pettit Apiaries, Georgetown, Ontario, Can.

A PROMINENT plantation owner of Habana, Cuba, desires to get in touch with an expert beekeeper who could start a series of apiaries for him and conduct them. Address applications "B," care of the American Bee Journal.

WANTED—Young man of energy and character who really wishes an opportunity to learn practical beekeeping where carloads of honey are produced. Every chance to learn and small wages given. Write, giving age, height, weight, habits, former employment, experience, photo, all in first letter, 1,200 colonies, 16 apiaries.
E. F. Atwater, Meridian, Idaho.
(Former Special Field Agent in Beekeeping, U. S. Dept. Agr.)

WANTED—Students to help in apiaries.
Van's Honey Farms, Hebron, Ind.

WANTED—Situation by young man, age 26, who wishes to take up bee culture. Some experience with bees. Willing worker. Experience rather than high wages wanted.
John Peterson,
4304 North Avers Ave., Chicago, Ill.

WELL QUALIFIED MAN wants position with beekeeper. Go anywhere. J. G. C.,
Care Bee Journal.

WANTED—Single man for steady work with bees. Modern equipment, extracted honey. Give age, experience and wages expected in first letter.
B. F. Smith, Jr., Fromberg, Mont.

WANTED—By experienced man, bees on shares M. Knudsen,
153 Institute Place, Chicago, Ill.

WANTED

ATWATER honey, small lots 8½c; car lots 8c.; package bees, also.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

BEESWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire. Dadant & Sons Hamilton. Ill.

SITUATION WANTED for the season of 1923 in commercial apiary, or as assistant, with queen breeder, by middle-aged unmarried man of perfect character. Have fair experience with bees. The South or West preferred, though others may write. Offers solicited.
Joe Gates, Rt. 4, Hazen, Ark.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah

WANTED—Thirty to fifty used Danzenbaker supers.
O. W. Johnson, Le Grand, Iowa.

WANTED—Second-hand hand foundation mill. W. H. Elliott, Chapanoke, N. C.

WANTED—Old postal stamps and envelopes.
R. LeMang,
25 Quincy St., Passaic, N. J.

WANTED—Good planer.
H. N. Boley, Hillsboro, Iowa.

WANTED—To trade for bees, Veile speedster, two touring cars, Harley Davirson motorcycle, 17-jewel Elgin watch. For full particulars write.
Parlan McGivern, Maringo, Iowa.

I WOULD LIKE to hear from party wishing to buy interest in a good bee and honey business. Chas. M. Boothby,
Griggsville, Ill.

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 1922 price list. Our quotations will interest you.

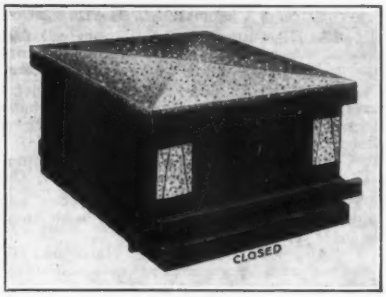
The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

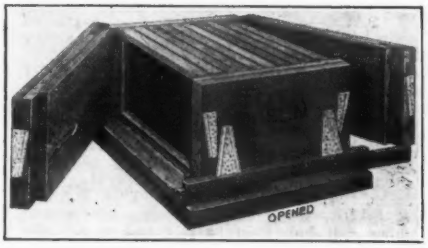
Booking Orders for May Delivery 1923

My introduced-laying-enroute queens and packages. One good, vigorous, young queen, one standard Hoffman frame of emerging brood and adhering bees, and one additional pound of bees Price complete f. o. b. Bordelonville, $5.00.

Additional frames of brood, or additional pounds of field bees to make larger package, $1 each, respectively in above packages. Bees and queen Italians. Queen introduced and laying enroute to you. Health certificate attached. Safe arrival and satisfaction guaranteed. One-fifth cash books order. Send for circular and names of satisfied customers in your state. Complete references given.

Jes Dalton, Bordelonville, La.





"TOTH QUEEN" HIVE

It's a real movable hive. Either side can be removed and replaced. Air-proof. Quick and safe to operate. It's "STANDARD" ten-frame size. Is a real observation hive and ornamental for any garden. Price, $8 for double-walled and $3.50 for single-walled. Send all orders, and write for full information, to

JOHN TOTH, Peoria, Illinois

R. 3, Box 253, Pekin Road,

Reference: Merchants and Illinois National Bank of Peoria.

We Manufacture Foundation

and make a specialty of working your beeswax into foundation for cash or wax in payment.

Ship your wax now for 1923 season. We furnish a full line of Supplies, Beehives, Sections, Frames, etc. The best made in Wisconsin. Write us for prices.

GUS DITTMER CO., Augusta, Wis.

ITALIAN BEES AND QUEENS

SUPERIOR ITALIAN QUEENS **WRITE FOR CIRCULAR**
POUND PACKAGES **FULL COLONIES, NUCLEI,**
CYPRESS BEE SUPPLIES

Hive-bodies, Covers, Bottoms, Supers, Frames. We can furnish you the best of the above at a fair price. Let us quote you.

One-pound package, with queen, 1 to 20, $3.25 each; 25 or more, $3.00 each.
Two-pound packages, with queen, 1 to 20, $5.00 each; 25 or more, $4.50 each.
Three-frame nuclei, with queen, 1 to 20, $5.50 each;25 or more, $5.00 each.

THE STOVER APARIES, MAYHEW, MISS.

BEAR'S WONDERFUL MOUNTAIN BRED ITALIAN BEES

Will give you a return on the money that you invest that can be excelled by no others. I send you one Hoffman frame, with honey and emerging brood, one pound of bees, one splendid young golden or three-band or leather-colored queen, mated and laying en route to you, and one pound of bees, for five dollars, or two frames of brood and the above for six dollars. These bees are raised high up in the Allegheny Mountains, where conditions make for long-range honey gathering. No man in the United States can ship better bees than these are. Send me a trial order; place your order now for May delivery; 10 to 20 per cent books your order. Canadians, I can save many of you one to two thousand miles of the long haul over orders from the south and west. Safe delivery guaranteed. (These three words mean what they express). Health certificate. Send the order now.

HIRAM H. BEAR, Hinton, West Virginia

NUCLEI, PACKAGE BEES and BRIGHT 3 BAND QUEENS

HARDY ITALIAN BEES and QUEENS, reared from the FINEST BREEDING STOCK, by methods and care such as give them qualities of their mothers. Read this from a veteran beekeeper who tried them: Mr. Ulis Blalock.

"Dear Friend: The season just closed has been very bad; no honey to speak of. The queens I bought of you are a fine lot, all extra good, and the largest and most prolific I ever saw, and every one purely mated. You get all my future orders. I got a square deal." (Name on request).

This is the kind of satisfaction I give and guarantee.

Prices: Packages, with queen, 1 lb., $2.75; 2 lbs., $4.00; 3 lbs., $5.25. Nuclei, with queen, same price, 1, 2 and 3 frames, respectively. Queens, $1.25 each. NO BETTER can be bought. There is no disease near here. I GUARANTEE safe arrival and complete satisfaction. Free booklet describes stock and methods. Write for it.

ULIS BLALOCK, Christine, Texas

RELIABLE BEES AND DEPENDABLE SERVICE

We pay transportation on everything we ship.

Prices of Packages and Queens, Express or Postage Prepaid

1-lb. pkgs. with selected young queens	$3.25 each	(for beginners)	$6.50 each
1½-lb pkgs. with selected young queens	$4.00 each	25c less per package on lots of 12 or more.	
2-lb. pkgs. with selected young queens	$5.25 each	Untested, selected young queens	$1.00 each
3-lb. pkgs. with selected young queens	$6.25 each	Tested selected young queens	$2.00 each
1-frame nuclei with 2 lbs. of bees and selected young queen		Wings of queens clipped free of charge, on request.	

Prompt delivery, safe arrival and satisfaction guaranteed. No disease. Let us book your order. Only 10 per cent cash with order, and balance just before shipment. Our new 1923 booklet telling all about our bees and clover seed now ready to mail. When comparing our prices with others, don't forget, "Jones pays the freight."

Buy some of the clover seed, far the best. See Classified.

M. C. BERRY & CO., Box 697, Montgomery, Ala., U. S. A.

ROOT QUALITY QUEENS AND PACKAGE BEES

You need Root Queens to improve the honey-gathering qualities of your bees

QUEEN PRICES APRIL 15 to OCTOBER 15.

	1 to 9	10 to 24	25 to 49	50 to 99	100 or over
D312000—Untested	$1.50 each.	$1.40 each.	$1.35 each.	$1.25 each.	$1.15 each.
D313000—Select untested	2.00 each.	1.90 each.	1.80 each.	1.70 each.	1.60 each.
D314000—Tested	2.50 each.	2.35 each.	2.25 each.	2.10 each.	2.00 each.
D315000—Select tested	3.00 each.	2.85 each.	2.70 each.	2.55 each.	2.40 each.

PACKAGE BEES—Experience has taught us that 2 lbs. of bees in a package will ship better than a lesser or a greater amount of bees. It has been demonstrated that better results in honey producing are obtained from 2-lb. packages of bees than from 3-lb. packages.

Prices of Bees in Two-pound Combless Packages by Express—April 15 to August 15.

	1 to 9 pkgs.	10 to 24 pkgs.	25 to 49 pkgs.	50 or more
D310800—2-lb. pkgs. of bees	$6.00 each.	$5.50 each.	$5.00 each.	$4.00 each.

Add price of queen wanted to package price given above. Large quantity lots quoted on application. These prices are F. O. B. Shipping point. NOTE: Early spring delivery on package bees will be made from Bay Minette, Alabama. Beginning May 15, package orders can be filled from Medina.

THE A. I. ROOT COMPANY, West Side Station, Medina, Ohio, U. S. A.

NUCLEI — 1923 April and May Delivery

We are prepared to book orders for April and May, three-frame nuclei with tested or untested queens. Our capacity, after 15th of April will be 1,000 nuclei—a few before that date.

We are located less than two and one-half days from New York and Chicago by direct express shipment.

Our apiaries are located on the Florida Keys, five miles from the mainland, in disease-free territory, and nothing but brand new bee supplies and equipment are allowed to come from the outside into our apiaries. We do not want you to return the shipping cages.

Prices:

Two-frame nuclei, without queen	$4.25	Untested queens	$1.00 additional
Three-frame nuclei, without queen	5.25	Tested queens	2.00 additional

Discounts on quantity orders

Guarantee: We guarantee safe arrival and will replace losses or refund money on express delivery receipt signed in full by the Express Agent showing the apparent damage done in transit.

C. E. BARTHOLOMEW, Manager.

HUGH M. MATHESON'S APIARIES, 418 S. W. 2nd Ave., Miami, Florida

You can have cash for your wax and old combs or cappings at the market price, or we allow a little more in exchange for supplies

Write for our terms and prices

"falcon" Supplies, Queens, Foundation

Booklet, "Simplified Beekeeping for Beginners" free

Write for catalog

W. T. FALCONER MFG. COMPANY, Falconer, (NEAR JAMESTOWN) N. Y., U. S. A.

"Where the BEST Beehives come from"

QUEENS

PACKAGE BEES NUCLEI

QUEENS

FOR YEARS WE HAVE BEEN SHIPPING THOUSANDS OF POUNDS OF BEES ALL OVER THE U. S. A. AND CANADA

Now is the time to place your order for spring.

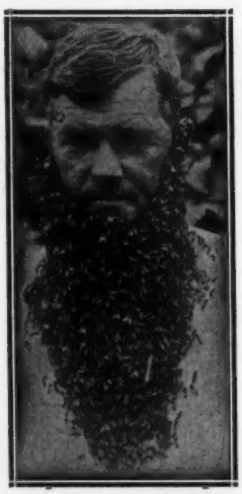
Send for our 1923 Circular, it's free.

We can save you money by ordering early.

The very best of Bees and Queens.

ITALIANS CARNIOLANS GOLDENS

NUECES COUNTY APIARIES, CALALLEN, TEXAS



The same old man
In the same old place
With the same old whiskers
On the same old face.

Yes, I admit that my whiskers are getting a little old, but not so my methods of queen rearing, which are slap bang up to date. We are entering the season with a great deal of enthusiasm, as everything points to a good season for all beekeepers. We have made big improvements in all lines of queen rearing and expect to—well, just write for our catalog, which tells the whole story.

PRICE LIST—Untested Queens

Before July first:	
1 to 4 inclusive	$2.00 each
5 to 9 inclusive	1.95 each
10 or more	1.90 each
After July first:	
1 to 4 inclusive	$1.50 each
5 to 9 inclusive	1.45 each
10 or more	1.40 each
Breeding queens service guaranteed for the season	10.00 each

JAY SMITH ROUTE 3 **Vincennes, Ind.**

Quality and Service From

FLORIDA BRED GENUINE THREE BAND LEATHER ITALIANS

Shipped on good combs of natural stores insures arrival in fresh condition, and quickly build strong, hustling colonies. Constant improvement in select breeding from bees possessed with rare qualities of vigor, gentleness and beauty enables us to offer a great honey gathering strain. Safe arrival and satisfaction guaranteed. No disease. Certificate of inspection with each shipment. 20 per cent cash books order, balance before shipment.

Prices include choice queens.

	1 to 11	12 to 24	25 or more
2 lbs.	$4.50	$4.25	$4.00
3 lbs.	5.50	5.25	5.00
3-fr. nuclei	5.75	5.50	5.25

10-fr. colonies $15.00.

M. L. NISBET & BRO.
P. O., Bainbridge, Ga.

"The Lumber That Lasts" **FOR** Bee Hives Hive Bottoms Hive Stands

The only lumber that a well informed bee keeper will consider is genuine "ALL-HEART"

"OF COURSE" "TIDE WATER" CYPRESS "THE WOOD ETERNAL" "OF COURSE"

"Because, why?"—

Because he has learned by experience that "All-Heart" Cypress resists rot to such a remarkable degree in all cases where extremes of weather conditions—hot or cold, wet or dry—have to be met and overcome, that it is "the only."

Write our All 'Round Helps Department, for reliable counsel on the solution of any lumber problem that's on your mind. Address

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION
1251 Poydras Building, New Orleans, La., or 1251 Graham Building, Jacksonville, Fla.

Insist on "Tide Water" Cypress—you can identify it by this mark:

YOUR LOCAL DEALER WILL SUPPLY YOU. IF HE HASN'T ENOUGH CYPRESS LET US KNOW AT ONCE.

THE DIAMOND MATCH CO.

(APIARY DEPT.)

MANUFACTURERS OF

Beekeepers' Supplies

CHICO, CAL., U. S. A.

Dadant's incomparable Foundation is always kept in stock. Western Beekeepers can be supplied advantageously.

EASTERN DISTRIBUTORS

HOFFMAN & HAUCK, 1331 Ocean Ave. WOODHAVEN, N. Y.

The Diamond Match Company requires responsible agents in the Central States who are in a position to handle car load lots.

BEEKEEPERS, wherever they may be located, before deciding where to obtain supplies, should write to the Diamond Match Co. for prices and for their Beekeepers' Supply Catalog.

They own their own timberlands and sawmills, from the tree to the finished product; no middleman takes out a profit.

Full advantage of this low cost of production is given to the purchaser.

The Apiary Department (which is in charge of experienced supply men, who are also practical beekeepers) maintains a constant excellence of product and offers unsurpassed service.

ALUMINUM HONEYCOMBS

The Diamond Match Co. and their agents are the sole distributors in the United States of the Aluminum Honeycombs, manufactured by the Duffy-Diehl Co., Inc., of Pasadena, Calif. Write for descriptive pamphlets. Eastern beekeepers should send their orders for the Diamond Match Co.'s supplies to Hoffman & Hauck, 1331 Ocean Avenue, Woodhaven, N. Y.

DIAMOND MATCH CO., Apiary Department

CHICO, CALIFORNIA

What Makes the Best Foundation

When you select the best foundation for your hives do you consider the importance of the way the wax is refined and milled? The AIRCO special process of refining beeswax produces a denser, tougher, cleaner and more ductile wax than any other method known. AIRCO milling produces a foundation that has a thinner base, a base with a natural-comb angle and with no imperfect cells. AIRCO foundation has a true-to-nature imprint. The base angle of the cells in AIRCO is 120 degrees instead of 140 degrees, and this saves the bees considerable time. Comb foundation that has been made according to the famous AIRCO refining process and milled on the new type machine is without question the best foundation.

Today this wonderful AIRCO refining and milling process is used in the manufacture of our single and Three-ply foundation.

A sheet of Three-ply AIRCO (between clamps) holds up a 68-lb. boy.

Single Ply Airco Foundation

AIRCO single-ply foundation has proved during the past four years to be a foundation of exceptional value. The increasing demand for it shows plainly that the beekeepers like it. There is no equally good foundation made for the same price, and it is to be highly recommended for surplus honey production.

The Strength is in the Comb

The best foundation for the brood chamber and the extracting super today is the Three-ply AIRCO Foundation. It has more than **double strength,** eliminates drone cells and the bees do not gnaw around the wires. No melting down in hot weather. Three-ply AIRCO Foundation has a center ply of pure beeswax, toughened by a small percentage of pure vegetable wax. The other plies are made of the purest, softest beeswax known. When wired horizontally it produces straight combs without an equal. One of our laboratory tests shows that at the temperature of the hive (96 to 98 degrees) AIRCO Three-ply Foundation possesses nearly three times the tensile strength of our single-ply AIRCO Foundation.

What Beekeepers Say

"Your new Three-ply Foundation shipped me the latter part of October arrived in excellent condition, the edges not being broken nor corners shattered. My opinion is that it will ship and arrive in better condition than your single-ply AIRCO."—Simon O. Allen, Gen. Mgr. The Allen Apiaries, Delphos, Ohio.

"I used AIRCO last year and found same to be the **best** foundation yet. He who buys AIRCO is wise."—John D. Shiber, Randolph, N. Y.

"There is no doubt but what you have the best foundation on the market.—A. M. Hunt, Goldthwaite, Texas.

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